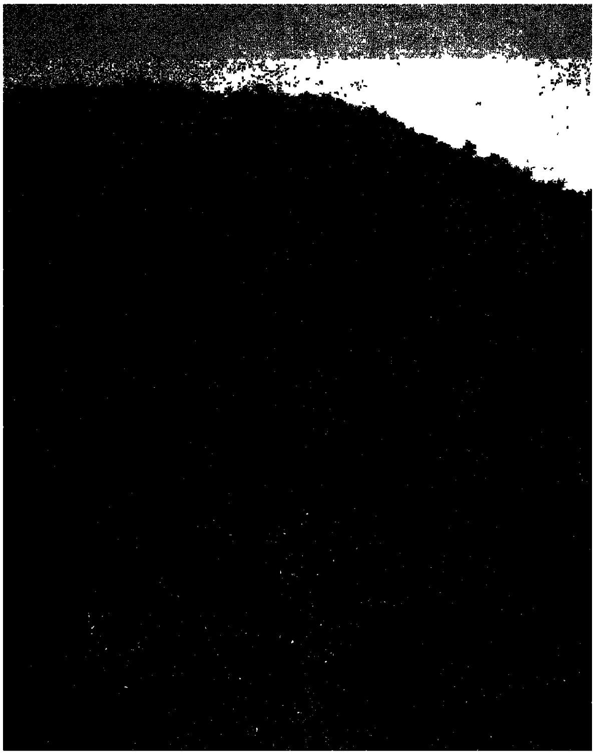
oint Forest Management Programme, Haryana Shivaliks

The Decade and Beyond

Evolving Community–State Partnership



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Editors

T P Singh
V Varalakshmi

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Message

I am extremely happy that the Haryana Forest Department (HFD) and the Tata Energy Research Institute (TERI) have brought about significant improvement in the management of forest lands in the Morni-Pinjore and Yamunanagar forest divisions of the Shivaliks, as a result of sustained efforts for the past seven years. It is heartening that the development has been people-centred with forest communities in the form of Hill Resource Management Societies taking an active role in conservation and use of forest resources.

The future of forest management in India lies in successful partnerships between the communities and the state. Their functioning should be based on decentralized planning developed in a multi-disciplinary framework and adopted to local needs and conditions. The transition to this system should be gradual and done collaboratively by different government departments with assistance from non-governmental organizations and participation of local community members.

This book documents such an effort which began close to a decade ago. This unique success story has been well presented for others to learn from and suitably replicate. I congratulate the officers of the HFD and the researchers of TERI for their dedicated work and wish that this would lead to many more success stories such as this one.

Yadav

Jagdish Yadav
Minister of State for Forest
and Education
Haryana, Chandigarh

Message

The Joint Forest Management (JFM) in its current form is a relatively new concept in India. It is a drastic change from the age-old principles that guided the management of India's forests. The need for joint management was felt when the growing pressures on forest resources arising from the local demands coupled with the national needs far exceeded sustainable limits leading to significant degradation of forest resources. The basic premise behind JFM is to involve the local communities in regeneration, protection, and sustainable harvest of forest resources in conjunction with forest departments (FDs). Such arrangements were experimented with earlier and had shown enormous promise in several cases. Based on these experiences, the concept of joint management was promulgated in the National Forest Policy of 1988 and a Government of India circular to the state in June 1990.

Haryana was one of the first states to formalize joint management. The concept was already established in the state with the well known Sukhomajri project of the Government of Haryana which began in 1976. Efforts to introduce JFM spread far and wide, specially after it was formalized in 1990. Dedicated officers of the Haryana Forest Department (HFD) are responsible for establishing Haryana as one of the front runners in this effort. We have been assisted by some committed non-governmental organizations, of which, the Tata Energy Research Institute (TERI) has contributed enormous to our efforts in the Shivalik region.

The HFD and the TERI have been associated for almost seven years in establishing the JFM systems in the Morni-Pinjore and Yamunanagar forest divisions. As a result of this joint venture, the Hill Resource Management Societies (HRMSs) in this area have emerged into dynamic bodies and effective partners in the management of our forest resources.

The association of the HFD with TERI has been a very close one. It exhibits a rare case of effective teamwork with prolonged dedication as various members of the HFD and enthusiastic professionals from TERI with proper training in forestry and sociology have contributed to this major initiative from time to time. I take this opportunity to congratulate the committee staff of the HFD for their pioneering work, and TERI for the assistance they have provided to us and the cooperation they have extended to the HRMS members.

This volume provides an extensive coverage of the transition to participatory management of forests in the 1990s in the Morni-Pinjore and Yamunanagar forest divisions. In addition, it traces the history of forest management in India, the intricate linkages of the forests and the people, and how forest policies have evolved over time. With this overall framework, it focuses on Haryana and narrates the evolution of forest management during the last two centuries. In the rest of the book, the implementation of JFM is documented in great detail in a lucid style. The book ends with a look at the future, the constraints that still persist, and plans for further development.

The richness of the text is derived from the first-hand field experience on which the narrative is based. It is further strengthened by the studies and the analytical understanding thus developed, which reflects the skills of the team members. I hope this book will be widely read and utilized by all who are involved in bringing about participatory management systems in forest areas.

B Dass

Banarasi Dass
Principal Chief Conservator of Forests
Haryana

Foreword

A sea change has set into the forestry sector with greater recognition of the symbiotic relationship between communities and forests. Even while policy shifts were taking place during the seventies and the eighties, instances of communities protecting natural forests either on their own initiative or with the encouragement of the forest department (FD) staff came to light. In the absence of any formal programme or project to foster the spread of local forest protection, community forest protection groups started emerging in West Bengal, Haryana, Orissa, and other states. The Ministry of Environment and Forests, Government of India, issued guidelines in June 1990 notifying that exclusive rights to forest products be extended to those villages effectively protecting public forest lands under a new programme of Joint Forest Management (JFM). Till date, 20 states have issued enabling orders for the implementation of JFM.

The JFM programme of Haryana is among three projects worldwide to be presented with the **Saving the Drylands** award for the year 1997/98 instituted by the United Nations Environment Programme (UNEP). This programme was evaluated on the basis of its sustainability, replicability, and the socio-economic and environmental impacts of institutional and policy initiatives. The award reiterates the commendable work done under the project and Haryana as a pioneer in the JFM programme in India. This award is also a recognition of the policy and institutional support provided by the Government of Haryana, the Haryana Forest Department (HFD), the Tata Energy Research Institute (TERI), and above all the enterprising people of the Haryana Shivaliks.

The Decade and Beyond documents the JFM programme in Haryana, which started as an experiment in Sukhomajri village in the late seventies, highlighting the importance of providing alternative sources of livelihood to villagers to reduce their dependence on forests. With dramatic regeneration of vegetation in the pilot watersheds, and other benefits like increased production and availability of fodder, the local people were more receptive to suggestions and advice of the HFD. The programme is now operational in 60 villages in the Morni-Pinjore and Yamunanagar forest divisions, which are organized into 55 Hill Resource Management Societies (HRMSs).

TERI, over the last decade, has been collaborating with the HFD for institutional development, both within the department and the local village communities.

The objectives of TERI's involvement have been to integrate JFM into the policies, programmes, procedures, and operations of the HFD as well as to motivate local communities to protect and manage the forests on a sustainable basis for their own benefit. That issues of gender, equity, and benefit-sharing were the focal points of the programme, reflect the commitment of the HFD and TERI to people's involvement in the entire process.

While *The Decade and Beyond* is about the evolution of a partnership between the village communities in the Haryana Shivaliks and the HFD, the scope and implications of this book are universal. India with its burgeoning population, both human and livestock, and limited land and natural resources, has been developing resource management practices with people's participation that are efficient and effective in the conservation and sustainable use and management of natural resources, particularly forests. The wide range of strategies that have been tried for the rehabilitation of the Haryana Shivaliks has lessons for those confronting resource management issues.

The concept of JFM represents a major breakthrough in providing an avenue for community participation in the conservation and protection of forests, and has become integral to reversing the trend of deforestation seen in recent decades in several parts of the globe. *The Decade and Beyond* may have lessons for many—FDs, researchers in the field of natural sciences, non-governmental organizations and, of course, communities whose livelihood and sustenance depends on forests.

R K Pachauri
Director
TERI, New Delhi

Preface

India's forests continue to deteriorate under increasing stress from the human and livestock population. The inevitability of continued forest and natural resource depletion, much to the detriment of the country's ecological stability, economic viability, and environmental quality, has led to the exploration of managerial alternatives that can control, and even reverse this phenomenon. The effective and meaningful involvement of local communities through the linking of socio-economic incentives and forest development has been singularly instrumental in eliciting community participation. The institutional involvement in various forest protection and developmental activities has made promising impacts on the biophysical and socio-economic environment of the area. While information is growing about the salient features of successful joint management and benefit-sharing arrangements, more research and practical experience is required to design Joint Forest Management (JFM) as an effective alternative to current traditional forest management practices.

There has been a perceptible change in the manner in which JFM was adopted in different states and received by people. All forestry programmes currently being initiated and implemented emphasize on people's participation. These projects envisage a progressive transition to decentralized management of forests with a healthy and generous relationship being established and nurtured between the state and the forest-dependent community. Continuous interaction and dialogue on an equal footing among local communities, forest administration, and planners is pertinent for a successful JFM programme in India.

The issues and concerns that have emerged in the pioneering states are likely to be faced by other states which have started JFM implementation in the recent past. These issues need to be addressed systematically to chalk out future strategies with regard to the JFM programme in India. The scope for the rapid and effective adaptation of the JFM approach on a significant enough scale needs to be evolved particularly on an institutional, ecological, and economic framework on the basis of experience gained in several states, especially Haryana. *The Decade and Beyond* is a detailed documentation of the evolution of the JFM programme in Haryana based on the Tata Energy Research Institute's (TERI's) experience of being involved in this programme for a decade now.

The significant impacts of the programme interventions on the social, economic, institutional, and ecological aspects of the programme have been highlighted along with the future initiatives that are required to sustain this successful programme. The marked improvement in the forest resource, improved socio-economic status of the people, and the strong institutional mechanism that binds the Haryana Forest Department and the Hill Resource Management Societies (village-level people's institutions) point to the positive impact of the programme. It is heartening for us to convey to the readers that even while this book is being published, the Government of Haryana has approved the rules for the JFM programme in Haryana. These rules, it is hoped, would take care of the many concerns that have been raised throughout the book with respect to different aspects of the programme.

There has been a gradual, but consistent, shift in attitudes and actions of the state and the community towards building up a partnership for the regeneration and rehabilitation of forests. *The Decade and Beyond* would surely provide lessons and hope for many in India and across the globe.

T P Singh
V Varalakshmi
Editors
TERI, New Delhi

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The Publications Unit at TERI has been responsible for the production and publishing of this document. Mr K P Eashwar coordinated the production and copy-editing; Mr T Radhakrishnan designed the book, and Mr R K Joshi designed the cover. The Documentation and Information Centre did the indexing for this book.

State of the forests

Of the total recorded forest area of 76.5 million hectares (mha), the reserved, protected, and unclassed forests constitute 54%, 29%, and 16%, respectively. Of this area, certain portions have specifically been earmarked for preservation of wildlife, flora, and natural ecosystems. This has been done through the creation of national parks (central legislation) and wildlife sanctuaries (state legislation).

The sixth assessment of India's forest cover in 1997 reveals a decrease of 0.5 mha in the actual forest cover of the country, thereby manifesting a reversal of the increasing trend of the 1991–93 assessment (FSI 1996, 1998). According to this assessment for the period 1993–95, the actual forest cover of the country stands at 633 397 km^2, which is 19.27% of the total geographic area of the country. The 80 national parks and 441 wildlife sanctuaries of the country cover 4.5% of the geographic area and 19.45% of the recorded forest area.

Out of a total of 413 districts for which forest cover assessment was done, 105 districts of the country have forest cover more than 33%, 52 districts have forest cover between 19% and 33%, 226 districts have forest cover ranging up to 19%, and the remaining 30 districts do not have any discernible forest cover (FSI 1994). The growing stock of India's forests is estimated at 4740 million cubic metre (mcm) and the average volume per hectare is 74.42 m^3. The total annual increment of the growing stock is estimated at 87 mcm.

Traditional forest protection systems

Forest resources are significantly linked to national and local economies and rural life-support systems. The strong dependence of human society on biota for survival has spanned several millennia, and has resulted in deep cultural and religious traditions of conservation and prudent use of natural resources to enable a large human population to co-exist relatively harmoniously with nature (CSE 1982). In the Indian context, a significant population consists of 'ecosystem people', the relatively poor inhabitants of agriculture villages and tribal hamlets, whose quality of life is intimately linked to the productivity and diversity of living organisms in their own restricted catchments (Gadgil, Guha 1995).

While in recent years forest resources have been subjected to diverse and often conflicting national and local needs (Shashi Kant *et al.* 1991), there are, however, cases of successful protection of these by traditional rural communities through adoption and adherence to social norms and sanctions, and enforcement of rules and regulations (codified or otherwise) (Thapa, Weber 1994). The ability of communities to create and sustain institutions to manage resources successfully in the face of changing state policies, demography, and market forces has been established (Wade 1988). In this context, the need for empowering the user-communities and paying greater attention to their interests in the organization of the economy must, therefore, accompany attempts at conservation and restoration of forests and their biodiversity on a larger scale (Gadgil 1993).

In India where the subsistence of over 70% of the population is dependant on land and land-based resources (Romm 1981) through agriculture (142.51 mha) (MoA 1996) and forests (68.07 mha) (FSI 1996), community-based management systems have been crucial in sustaining the resource base and preventing them from becoming open access resources. These systems of self-governance and resource management have corresponded to ecological and cultural diversities (ANGOC 1994).

Dependence on forests has been institutionalized through a variety of social and cultural mechanisms. Similar self-regulatory mechanisms prevalent in the Nepal Himalayas have been documented (Arnold, Campbell 1986). Village-level institutions have been successful in undertaking environmental regeneration through their ability to effectively resolve/arbitrate disputes that may arise due to resource use (Narayanan 1991). More importantly, micro ecosystem-based development recognizes the special relationship of tribals with forests, where the state owning the forests and commercial interests have failed (Fernandes, Kulkarni 1983). Most forest management and planning have largely neglected the subsistence needs of local villagers and have failed to see the importance of forest resources as life-support insurance for the rural poor (Wood 1992). But community-based institutions, by providing for certain penalties and defences when violations occur, have been able to play a meaningful role in forest conservation and management against the increasing odds (Rawals 1971). It is precisely this institutional framework that has governed the distribution of rights in livelihood resources, which is important for long-term ecological and social sustainability (Andersen 1995). The futility of the stop-gap arrangements of the government for forest and biodiversity conservation/protection is reflected in the neglect and mismanagement, combined with acute resource shortages as population grew over the years (Lynch, Talbott 1995).

Pre-British India had a rich tradition of community-based forest protection and management. It is well known that former Indian 'village republics' managed their own natural resources to the extent needed. The 19th century publications of Henry Maine on ancient law and villages in the east present arguments about property relations with ethnographic observations of Indian village communities. Maine observed that ancient law was never concerned with the individual but only with the group. A council of elders of the different caste groups in the village dominated by the upper castes provided a fairly effective community-based system. They evolved quotas on the quantity of fuelwood gathered or the number of cattle grazed. Restrictions on harvesting of fuelwood and the number of cattle that grazed in forest areas were determined by considering seasonal variations in the availability of forest produce. The regulations were enforced by the community by employing watchmen from amongst its own members and fining or otherwise punishing offenders.

Studies of ecological history in India indicate that resource conservation has been a dominant concern of Indian society. In good and bad times, by invoking scriptures and by creating institutions for sustainable resource management, rural communities have promoted biological diversity, and such examples abound across India. From Sikkim to Kerala, hundreds of sacred groves were protected in the interiors of the forest. In the Khasi Hills of Meghalaya and the Puddukotai district of Tamil Nadu, there is evidence that despite all the damage done by the biotic and abiotic forces, the sacred groves exhibit greater biological diversity in terms of both flora and fauna than surrounding forest areas. The *Sthala Vrikshas* or temple trees of Tamil Nadu also suggest that since pre-Vedic, food-gathering times, religious belief has been harnessed to aid natural resource conservation in the country.

Similarly, the people of Uttara Kannada district of Karnataka also have a rich tradition of nature conservation. These include: (1) the protection of individual plants and animals considered to be sacred; (2) the protection of specific life history stages of birds; and (3) the protection of sacred ponds and entire biological communities in sacred groves. Animals have been protected from over-hunting through devices such as a ban on hunting of fruit bats at the roosting sites. However, the above description should not lead us to assume that all subsistence-based societies in pre-British India lived harmoniously with the natural world. Hunter-gatherer communities who are not tied to any specific resource base and well-defined territories may have little to gain from prudent resource use.

Perhaps the most often-quoted example of traditional forest management is the case of Garhwal and Kumaon regions in Uttar Pradesh (UP). In these areas, prior to the British conquest in 1815, forests were used and managed by the peasantry. People had unrestricted access to the forest and wasteland that surrounded their village. Since forest and pastures were an important part of the village economy's natural resource base, boundaries between villages had evolved to regulate their use. Forests within boundaries were considered to be the common property of the inhabitants, who had the exclusive right to use them. The areas within the boundaries were not small.

Changes in resource use and management approaches

With the establishment of British colonial rule in India during the 19th century, the state gradually transformed these local and possibly collectively-managed natural resources, primarily forests, into government property. This restricted the access of the previous users and frequently turned their rights of customary law into 'privileges' and 'concessions' granted by the state. The British used the right of the state's eminent domain as the basis for gazetting state forests. In 1878, 14 000 square miles of state forest was recognized. By the year 1900, this had increased to 81 400 square miles of reserved forest (RF) and 8300 square miles of protected forest (PF). State forest revenues increased dramatically, not only from timber but from a variety of forest products termed 'minor forest produce' and even today the state continues to hold formal monopoly over these products (Andersen 1995).

The history of Indian forestry can thus be viewed as a history of the process by which the state gradually appropriated forest resources on the pretext of generating revenues. It is also a history of the gradual erosion and loss of entitlement formerly enjoyed by local communities and as a corollary, their capability to command those assets which provided critical inputs to local agricultural systems. In the case of hill areas, collection of forest products by villagers became an offence against the state except in places such as the Shivalik hills and in Himachal Pradesh where the official land survey and settlement scheme had incorporated the concept of local 'rightholders'. But even in these areas, the process of demarcation of village or *Shamlat* forests and the acquisition of land outside the jurisdiction of the revenue village resulted in a gradual erosion of the group rights, which regulated the use of these forests.

Forests were divided by the British into two broad categories: RF and PF. RFs were exclusively for the use of the Forest Department (FD), and the surrounding villagers, had no right other than the ones explicitly permitted by the state. The PFs were also managed by the FD, but the people had certain rights on them, such as gathering fruits and other produce of the trees, specifically for household use and not for sale. They also had the freedom to graze their livestock and hunt wild game for domestic purposes. At the turn of the century, the areas under RF and PF were 20 and 2.4 mha, respectively (Stebbing 1927), which increased to 31 and 15 mha at the time of the country's Independence in 1947. Since then, the net area under the control of the FD has further increased to 67 mha (FSI 1998).

The state has increased its control over land primarily through two processes. First, after the abolition of the princely states and landlordism, all lands under their control became vested in the state. The larger tracts were handed over to the FD generally as PF and the rest was vested in the village *Panchayats* which were under the overall control of the Revenue Department. Their use by the *Panchayats* was regulated by local acts, like the Revenue codes, and *Panchayat* acts. The second process of extending government control over forests was through acquisition of private forests. These laws were passed by the various state governments in the two decades following independence. Massive tree felling took place from these forests because of the fear that these forests would be nationalized.

The story of state control is not confined to the British colonial period. It continued unabated after the country gained independence. The FD in post-colonial India continued to be concerned primarily about revenue generation. The earlier colonialists' search for cheap raw materials and revenue was transformed into new national industrial interests in obtaining cheap raw materials, in a context where resources were becoming scarce. Many industries were granted raw materials at extremely low prices and certainly well below the costs of replacement. The 1952 Forest Policy of the Government of India maintained *status quo* by perpetuating the monopoly rights of its predecessor from 1927. This ensured that the monopoly rights in forest resources were vested in the state rather than local communities, and justified in terms of national interests such as defence, industries, and communications, in addition to revenue generation. The revised policy states: 'village communities in the neighbourhood of a forest will naturally make a greater use of its products for the satisfaction of their domestic and agricultural needs. Such use, however, should in no event be permitted at the cost of national interests'.

The policy of subsidizing state-owned forest lands to furnish a cheap supply of industrial raw materials was carried to further extremes after Independence. In 1958, for example, bamboo was sold in Uttara Kannada for as low as Rs 1.50 per tonne (approximately thousand times less than the market value). Giant wild mango trees that regularly yielded much valued fruit, worth more than Rs 100 per year, were also made over to the plywood industry for as little as Rs 150 per tree. The result has been the rapid decimation of a whole range of species in the more humid tracts, especially on the steeper western hill slopes (Gadgil 1992).

The pre-British period was characterized by ownership and community management of forests, which ensured forest conservation. The population was low, demand was moderate and export was non-existent. Such being the case, there was plenty of fuel, fodder, and non-wood products for personal consumption and barter. Over time, the concepts and practices of forest conservation saw a steady decline which greatly intensified during the British rule.

Forest legislation

Forest legislation in India has undergone considerable changes within a relatively short period, essentially because earlier policies were flawed. There was a general lack of appreciation in that period for the idea that a living, dynamic forest is of far greater value than merely dead produce derived from its intensive manipulation and harvesting. India's forest policies originated more than a hundred years ago at a time when the colonial administration placed priority on commercial exploitation and state custodianship. However, over time, these policy and legislative measures proved inadequate to the task of conserving the forest resources in the face of rising stress from a growing population. This has led to frequent changes in policy to reflect changing opinions on the level of local community involvement that is needed for forest management. These frequent changes in policies have in turn affected management decisions.

Policies

While the first forest policy of the country was formulated in 1894 on the basis of a report of Dr J A Voelcker on the situation of agriculture in India, till date three national policies have been proclaimed. The emphasis of the pre-Independence policy especially the National Forest Policy (NFP) of 1894 was on agricultural expansion, which led to the subordination of forest conservation. The post-independence policy of 1952 emphasized the need for a balanced approach to forests, for complimentary land-use systems, the need for economic, ecological, and social benefits accruing from forests. Later the interdependence between people and forests was recognized by NFP 1988 and active community participation in the protection and development of forests was envisaged, along with the recognition that the rights and concessions from forests should primarily be for the bonafide use of the communities living in and around the forest areas.

Acts

The first attempt to treat forests as state property followed the enactment of the Indian Forest Act (IFA), 1865. The categorization of forests into RF (where most of the customary rights were withdrawn) and PF (where most usufructuary rights were allowed to continue) saw the consolidation of the regulations by the state on forest areas and forest produce (IFA 1878). There was further consolidation of the laws relating to forests, the transit of forest produce and duty leviable on timber and other forest produce (IFA 1927). Apart from the RF and PF, all other publicly-owned forests were later categorized as Unclassed forests. Following the ineffectiveness of the state governments in arresting the diversions of forest lands for non-forestry purposes, the Forests (Conservation) Act, 1980 was enacted to check and control the indiscriminate diversion of forests for non-forestry purposes. Under this Act, prior approval of the Central Government is required before any forest land is diverted for non-forestry purposes. All authorized diversions are allowed with the undertaking of compensatory afforestation.

National Commission on Agriculture

The National Commission on Agriculture (NCA), set up by the Government of India in 1970, took cognizance of the continued heavy dependence of people on forests for firewood, small timber, industrial timber and for grazing of their cattle, medicinal plants, etc. The Commission also highlighted the adverse effects of the increasing biotic pressures on the forests far beyond their carrying capacity. It advocated an ambitious programme on production and social forestry. Following the recommendations of the NCA, plantation activity, including social forestry activities that entail raising of forests outside traditional forest areas (e.g., village community lands and private lands), has expanded vastly.

June 1990 Notification

Consistent with the NFP of 1988, the Government of India, on 1 June 1990, issued policy instruction to all state governments supporting greater participation of village communities and non-governmental organizations (NGOs) in the regeneration, management, and protection of the forests. The implications of this notification are far-reaching and assertive in support of the Joint Forest Management (JFM) strategy. The Notification emphasizes the modalities for giving usufructuary benefits to the village communities, living close to the forest land, so as to ensure their participation.

This circular highlights the need and the procedure to be adopted for the involvement of village communities and voluntary agencies in the protection and development of degraded forests. In order to ensure community participation, the state governments have been advised to enlist communication and extension experts from local NGOs, to serve as interfaces between the FDs and local communities.

The Notification of June 1990 constitutes a significant departure in forest management practice, in that, increasing emphasis was laid on the active participation of the people in the programme of the forest conservation and development; by developing microplans and by participating right from decision-making stage to carrying out the decisions. A significant extension and facilitating role by grassroots NGOs is also envisaged for the success of these efforts. Another significant point to be noted in the circular is the benefit-sharing arrangement which is intended to enable village communities to develop a stake in the protection and development of degraded forests.

The Notification states that the programmes should be implemented under an arrangement between the voluntary agency, the village communities, and the State Forest Department (SFD). The village communities as beneficiaries are entitled to share usufruct to the extent and subject to the conditions prescribed by the state government. Voluntary agencies/NGOs, however, are not entitled to usufructuary benefits. Access to the forest and usufructuary benefits is only to the communities who get organized into a village institution, specifically for forest regeneration and protection. This institution could be either the *Panchayat* or a village cooperative, with no restriction on membership. It could also be a Village forest committee. The beneficiaries are to be given usufruct like grasses, lops and tops of branches, and other minor forest produce. If they successfully protect the forest, they may be given a portion of the proceeds from the sale of the trees once they mature.

The NFP of 1988, the June 1990 Notification, and the state government's resolution on JFM are fundamentally significant steps to involve and benefit the forest-dependent communities, in and around the forest. These enabling legal and administrative measures have created a conducive environment, which is manifest in the fact that as many as 20 state governments have passed resolutions providing guidance on adopting JFM. These states have issued orders/resolutions providing for the village communities to share the usufruct from the degraded forest areas that they agree to protect and develop.

Nearly 0.24 mha area is under joint protection in West Bengal, while 10%–25% of all the RFs and PFs are, under community protection in Orissa. In the UP hills, up to 30% of the forest lands are under community management. More than 25 000 people are engaged in the protection and development of about 15 000 ha of forest areas under the Joint Forest Management Programme (JFMP) in Haryana. Besides the programmes of SFD, user communities are collaborating with the FD in Gujarat, Jammu and Kashmir, Tamil Nadu, and Bihar to protect and regenerate degraded forests. According to one estimate, nationwide, nearly 3 mha of RFs and PFs is under JFM.

The acknowledgment of 'participatory development' as a critical ingredient in the process of a country's overall development has now percolated to the forestry sector. In this light, the new participatory forest management system being developed by some of India's SFDs and forest communities with active participation of local NGOs is a significant movement in contemporary management.

Matrix

The matrix of forest policies in India shows a continuous decline in the age-old symbiotic relationship between forest dwellers and the forest from the pre-British era up to 1952. The Forest Policy of 1952, which remained in operation till 1988, was marked by the complete breakdown of this relationship and a liquidation of community forestry management practices, thereby undermining the role and ability of village people. This erosion of social control that had been regulating the customary use of forest for centuries led to the alienation of local communities from nature. It was only in 1988 that people's role and participation in forest management was re-emphasized.

The matrix of forest policies is an indication of the changing forest development path that was pursued from pre-independence times to the post-independence period. This path is characterized by an initial shift from community-based management initiatives to a world view which was more oriented towards treating forest resources as commodities for commercial exploitation and revenue generation in favour of the ruling classes. This development path was not merely a product of British rule, but continued well into independent India in a slightly different form. While the British had propagated this view of forests on the pretext of their being a 'public good', independent India, carried this a step further by indicating that forest commercialization was in the 'national interest'. This matrix can perhaps be best explained by Frank's dependency theory dealing with an explanation for the underdevelopment of the Third World. According to this theory, British policies were designed to transfer raw materials from satellite colonies to western metropolises. In the post-colonial period, this system has simply been transplanted to the national level with villages replacing the colonies and the urban centres functioning as western metropolises, siphoning off the forest goods and products produced by the village satellites.

Starting from the British period right until 1952, it was hard for policy makers to grasp and conceptualize that those communities living inside or around the forest and fulfilling their basic needs, were not performing acts inimical to the safety and well being of forests. On the contrary, their continued involvement could actually pay to safeguard the forest, since in essence they viewed the forests as their own property, and thus were imbued with an important reason to preserve them.

It was only as late as 1988 when the National Forest Policy was formulated, that provisions were made for what Gadgil and Guha (1995) has termed the 'ecosystem people', to meet their basic requirements of forest produce from state-owned forests. This policy represents a great departure from the policies of the past, particularly in its recognition of multiple levels of planning and the need for people's institutions in the decision making process. This policy of 1988 was the first to identify the need for people's participation in forest management. This recognition of the need to bring about the large scale decentralization of the forest management process right to the village level, in order to ensure that people's cooperation is elicited in the regulation of forest activities and the maintenance of the ecosystem, is a landmark in the matrix of forest policies in India. Thus the matrix of changes in forest policy over the years, in a sense, tells a tale of how forest resources were snatched away from the hands of local people, before finally returning to them once more (Table 1).

Current status of forests in India: the worsening scenario

Increasing pressures

The rapid and impressive progress made by India in agriculture, industry, and infrastructure development has significantly impacted the natural resource base. The repercussions have been post pronounced on the country's forest. The expanding needs to produce more food, fuelwood, fodder, timber, and NTFPs from a dwindling biomass resource base, and at the same time keeping a minimum area under forest to maintain environmental and ecological stability is creating an imbalance. The last few decades have witnessed an unprecedented increase in demand for forest products, and the problem is likely to intensify further. Increasing biotic pressure from human and cattle populations, which is far exceeding the carrying capacity, has depleted both the area and the growing stock of forests. Management of forests with little concern for the social or ecological impacts has reduced not only the current availability of forest products, but also seriously jeopardized their regenerative capacity, thus impairing their future supply potential.

India's human population has risen from 361 to 880 million during the period 1951–94, and its livestock population from 292 to 450 million in the same period. India supports about 18% of the world population and 15% of world's livestock, with only 2% of world's geographical area, 1% of world's forest area, and 0.5% of world's pasture land. With increasing population and the overall rise in aggregate demand for forest-based produce, the pressure on India's forests has multiplied manifold. This is amply reflected in the decline of per capita forest area from 0.20 ha to 0.07 ha in the period 1951–95.

The degree of pressure on India's forests can be best understood by the points given below.

- Fuelwood requirement in the country has been estimated as 235 million m^3, while the forests can sustainably provide only 40 million m^3 (GoI 1987).
- Fodder requirement of the livestock in India is 780 and 932 million tonnes (mt) of dry and green fodder, respectively, while sustainable supply levels are only 56% and 27%, respectively (GoI 1988).

Table 1. Matrix of forest policies and shift in emphasis over the years

Policies	Management system		Immediate goals		Level of planning		Institution involved in decision-making		Recognized people's needs and aspiration	Production and regeneration priority	
	Centralized	Decentralized	Revenue extraction	Resource development	Macro level	Micro level	FD/ Govt.	People's participation		Silviculture	Biodiversity
Pre-British		■				■			■		
Forest Policy 1894	■		■		■		■			■	
Forest Policy 1952	■		■		■		■			■	
Forest Policy 1988	▪	■		■	▪	■	▪	■	■		■

Note. Relevant items to each policy are shaded to reflect emphasis.

- Industrial wood requirement, which has multiplied 24 times since Independence, is 2.3 times greater than the sustainable supply level (GoI 1987).

Reliable estimations of forest biomass extraction levels and supplies has remained quite difficult, as maximum consumption of forest products takes place through informal non-market mechanisms.

Since Independence, the diversion of forest lands for non-forest uses has continued, with a significant long-term consequences. Between, 1951 and 1980, about 4.3 mha of forest land was diverted for non-forest uses (GoI 1987). The total diverted forest land works out to 4.6 mha, which is 7.26% of the existing cover and 1.4% of the total geographical area. However, the official figures on non-forestry diversions relate only to planned and authorized appropriation of forest land, and unofficial diversions and illegal encroachments are estimated to be much higher. Till the enactment of the Forest (Conservation) Act, 1980, the annual rate of diversion of forest lands for non-forest use was of the order of 150 000 ha. Since the enactment of the Forest (Conservation) Act of 1980, the rate of diversion of forest land for non-forestry purposes has been checked and brought down considerably.

Attempts to encroach government forest lands for cultivation had been a regular phenomenon since Independence. Encroachments on forest lands have mainly been for creation of farms, extension of farms, and habitation. In majority of the cases, the land has been restored to the Government after deforestation has taken place. Though such deforestation rarely exceeds one or two hectares, the cumulative impact of such practices has increased the fragmentation of forests in terms of forest cover, crown density, and growing stock. Various state and Union Territory (UT) governments have officially diverted as much as 2.623 mha of forest land for agriculture during the period 1951 to 1980. In addition, many hectares of unoccupied non-forest government lands were also allocated for agriculture. It is estimated that 700 627 ha of forest land is under encroachment in various states/UTs.

Livestock grazing and fuelwood extraction are important factors for in the ecological degradation of India's forests. Grazing, browsing, and lopping of trees for leaf fodder and fuelwood render the trees severely defoliated, thereby reducing the rate of biomass increments. Grazing during monsoons destroys the newly emerged and regenerating seedlings, thereby, affecting the growing stock in the forests.

Permanent loss of forest cover and degradation of growing stock, because of putting forests to non-forestry use, and on account of heavy withdrawals, have been so severe that only 36.73 mha has got forest growth with more than 40% crown density and as much as 26.13 mha has got forest growth between 10% and 40% crown density and about 5.7 mha has only scrub vegetation representing crown density below 10%. The ecological and regeneration status of forests is also being damaged by frequent forest fires. The Forest Survey of India estimates that nearly 53% of the forest area is affected by fire, 78% of forests are subjected to grazing, and 74% forest area does not have adequate regeneration (FSI 1996).

These factors continue to degrade forest soils and destroy the natural regeneration of tree species.

Crisis

The present crisis in Indian forestry relating to high rates of deforestation and alienation of village communities from access to fuelwood and fodder from forests can be attributed to the twin processes of erosion of customary resource management regimes and the acquisitive tendencies of the state after Independence. It is estimated that there are about 100 million forest dwellers in the country living in and around forest lands and another 275 million who depend on the forests for their basic livelihoods. Besides fuelwood and other wood products, forests yield NTFPs like medicinal herbs which provide valuable income flows for subsistence communities. NTFP collection is a major activity in the states of Bihar, Andhra Pradesh, Maharashtra, Madhya Pradesh, and Orissa, which have large tracts inhabited by tribals. NTFPs like fodder and grasses, raw materials like bamboo, canes, and *bhabbar* grass used for artisan activities play an important role in the livelihood strategies of the poor. Forests also supply a significant portion of the total cooking fuel requirements in rural areas.

Considering the high dependence on forests for fodder and fuelwood, the deforestation and decline in forest condition can have very serious implications for rural populations and for public policy. There are many estimates which have been put forth on the deforestation rate in the country. Recent remote-sensing data during the period ending 1993 indicate that there has been no net deforestation rate at all. The diminishing forest cover in India caused by the exploitation by the FDs, industrial consumption, and household-use became a cause of concern to the NCA in 1976. The Commission recommended an aggressive programme of reforestation of denuded lands. An outcome of this effort was the social forestry programme in the country. Social forestry was defined as tree-planting activities aimed at meeting the needs of villagers and implying that in doing so, they would be kept away from the state forest resources.

Social forestry in the 1980s comprised, in addition to farm forestry on private agricultural lands and strip plantations along roads, tree-planting on barren public revenue lands for the creation of 'village woodlots'. These woodlots were ideally meant to meet people's biomass needs such as fuelwood, fibres, fodder, and fruits. The task was undertaken largely by SFDs. However, the experience with social forestry in India has not been very encouraging.

The FDs had little experience of working with local communities. Forest officials charged with the responsibility of executing social forestry projects invariably addressed the local government body: the village *Panchayat*. The *Panchayat* council members whom the forester addressed were educated and often well to do. The village *Panchayat* identified the lands for afforestation. Usually the poorer the community the more dependent on the access to and use of resources on public revenue lands. The bureaucratization of land and the resource-use decisions by the FD and the village *Panchayat* meant that revenue lands which functionally made up common property or open access resources were now apportioned by the government. Afforestation consisted of raising fast-growing monoculture plantations which on attaining maturity after about 8–10 years, would be auctioned by the FD. The involvement of, and benefits accruing to, the local communities were conspicuous by their absence.

There is evidently a case for working out a new approach to conservation of India's forest resources. It is clear that conservation priorities cannot be determined in isolation from local people, and broader patterns of natural resource use, but must be complemented by policies promoting sustainable and equitable development of the natural resource base as a whole. For a community-based resource management approach to be effective, much of the authority which local communities have lost must be restored along with appropriate financial incentives. Community-based approaches to forest management are beneficial in terms of meeting local resource needs and promoting biodiversity. Efforts to develop joint arrangements for forest management have met with mixed success. The *Van Panchayats* of UP and the forest cooperatives of Himachal Pradesh are examples of community management initiatives introduced prior to Independence, and they still survive.

JFM: the emerging alternative

India's forests have continued to deteriorate under increasing stress from human and livestock populations. The inevitability of continued forest and natural resource depletion, which is detrimental to the country's ecological stability, economic viability, and environmental stability, has led to the exploration of managerial alternatives which can control, and even reverse this phenomenon.

The increasing depletion of India's forest wealth has brought into a sharp focus the inherent inadequacies of the conventional system of forest management in sustaining the forest resource base against mounting human and livestock population pressures, industrialization, urbanization and overall economic development. The widening demand–supply gap of biomass for energy, fodder, timber and as pulpable raw material is creating an unprecedented imbalance. The limitations of the conventional approach have led to exploration of several alternative systems involving meaningful participation of forest-dependent rural communities in managing natural resources. Private and community efforts have a pivotal role in the sustainable management of forests and several successful models have been developed. Several models of participatory resource development in Haryana, Gujarat, West Bengal, Madhya Pradesh, and Orissa provide innovative examples of community management wherein, user community-based institutions are involved in protection, management, and development of forest resources.

The effective and meaningful involvement of local communities in evolving sustainable forest management systems is now being looked upon as a significant approach to address the long-standing problems of deforestation and land degradation in India. The linking of socio-economic incentives and forest development has been singularly instrumental in eliciting community participation. The institutional involvement in various forest protection and developmental activities have made promising impacts on the biophysical and socio-economic environment of the area.

The growing belief in Joint Participatory Forest Management (JPFM) stems from the widely-perceived limitations of the conventional 'Scientific Forest Management' systems in tackling these problems. More recently, a number of states have passed government orders supporting joint management arrangements following the 1 June 1990 Notification circulated by the Government of India. The circular supported joint planning and management of degraded government forests in all parts of India. In West Bengal, almost 237 000 ha is now reported to be managed by over 1700 forest protection committees (FPCs). In Haryana, 60 village communities have started catchment FPCs and village leasing of grass harvesting rights. In Orissa, FPCs now manage 180 000 ha of forest land, while in Jammu and Kashmir joint management of government forests has been initiated. Efforts to establish joint management of forest areas have also been introduced with active NGO involvement in Gujarat.

The FPCs in West Bengal are a famous example of successful joint management. Starting in 1972, the FD convinced local populations in Arabari in Midnapore district to protect public *Sal* (*Shorea robusta*) coppice forests through the formation of forest committees. In return, they were granted free usufruct of all NTFPs and promised a 25% share in the net cash benefits from the sale of short rotation *Sal* poles. This model has proved effective in improving the relationship between forestry staff and local people and in increasing *Sal* forest regeneration. Even though the government has had to share the benefits with these forest committees, it now receives higher revenues from the protected areas than it did when the areas were degraded.

A number of case studies have been carried out in different parts of the country on different aspects of the JFM experiment. In one cluster of 12 villages in Midnapore district of West Bengal, where village FPCs are effective, the villagers were found to utilize as many as 155 plant species out of a total of 214 for a variety of purposes. Community participation also aids in promoting biodiversity and eco-restoration. In a survey of 59 village communities in the hilly areas of Karnataka Western Ghats (Gadgil 1993), villagers consistently were in favour of use of a much larger number of species in plantations on common lands, than were attempted by the SFD. Initial results from these efforts indicate an overall increase in the level of forest protection and productivity. Studies by the Indian Institute for Bio-social Research and Development (IBRAD) using a sample of 42 FPCs in Jamboni Range have found the following:

1. 74% of the FPCs were functioning reasonably well;
2. there is considerable heterogeneity of ethnic composition and proportion of participating households among FPCs;
3. the smaller the number of villages participating, the greater the effectiveness of the FPC; and
4. the greater the proportion of households in each participating village included as FPC members, the better the management of the forest.

In many regions, joint management arrangements have created controversies because they have attacked long-standing traditions of communities. Participation of women as equal partners in joint management initiatives has proved to be one such stumbling block. The new West Bengal forestry project requires that women be joint members with their husbands and be granted equal rights. There is also a controversy regarding the definition of users of the forest. In both West Bengal and Haryana, there have been conflicts related to the status of secondary users, i.e., those hamlets more distant from the forest who have traditionally harvested products.

Undoubtedly, more research and practical experience is required to design an alternative to the centralized and authoritarian approach to forest conservation. Information is growing about the salient features of successful joint management and benefit-sharing arrangements. In forest areas, where a large proportion of the benefits accrue in the short term as rights to collect a variety of NTFPs, there is a broad distribution of benefits across income groups with substantial benefits accruing to poor and marginal households. Where the majority of forest products accrue to the user group only over the long term, as a share of rotational timber harvests, distribution systems may entail creating a user group fund for development activities rather than distributing shares. An important obstacle is likely to be the resistance of the central authority because a large bureaucratic apparatus to implement programmes locally would be completely unnecessary. This would entail rendering local governments more accountable to the people than is presently the case. The long-term success of joint management agreements between local communities and SFDs would depend on how these challenges are surmounted.

Evolution of JFM in the Indian states

The JFM is now being implemented in 20 states with enabling policies. The developments of a few pioneering states have been presented to understand the different forces that have led to the evolution of the programme into its present form.

Bihar

The JFM resolution in Bihar was officially passed in November 1990. However, in the tribal districts of south Bihar, communities have been active in forest protection since 1970s. A growing scarcity of forest resources and threats of exploitation by outsiders were the main motivating factors behind the community initiatives. But, in general, these community FPCs had little connection with the SFD. It was only later that the Bihar FD took keen interest in rehabilitating and protecting the forests with the use of participatory methods. Later on, as a consequence of the 1990 JFM Resolution, people were granted full rights to remove dry branches, leaves, and grass from the forest free of cost. But income from the other forest produce is divided into three parts: one part is used as village development fund, and the second as the forest development fund, and the rest for working plan expenditure. In 1992, 413 formal FPCs and 1000 informal committees were recorded as active in Ranchi district (SPWD 1992).

Gujarat

In the highly industrialized and agriculturally prosperous state of Gujarat, forest management with people's participation was first introduced by Vikram Sarabhai Centre for Development Interaction in two villages in Sabarkanth district; and this was followed by efforts of the Tree Growers' Cooperative Society. The Gujarat State Government formally passed the JFM Resolution in 1990. The Gujarat Government encourages the FPCs known as *Gram Vikas Mandal* (GVM) to register themselves under the Cooperative Society Act so that they can be given statutory status. Another unique feature of the JFM in Gujarat is that one seat is reserved for NGO in the management committee of GVM. One distressing feature of the Gujarat JFM is that it promises wage employment to sustain the interest of the people in the programme. The JFM in Gujarat is mainly concentrated in Surat, Bharuch, Panchmahals, Surbarkantha, Junagadh, and Khede districts. By 1992, 312 GVMs were in protection of 20 000 ha of forest land (SPWD 1992).

Himachal Pradesh

People in Himachal Pradesh have been enjoying various forest rights since British days. To make people active in forest protection, Himachal Pradesh launched a Social Forestry Project in 1985. Later in 1993, the government decided to constitute village FDC for JFM for planting, protection, afforestation, and judicious use for eco-development thereby bringing 50% of the area under forest cover by the year 2000. Implemented as an Overseas Development Administration (ODA) project, emphasis has been laid to enhance the capacity of the FD staff as well as people on joint forest planning and management through workshops and field meetings with local people especially women. Almost all leaders of *Mahila Mandals* and *Panchayats* were contacted under this project. As a result, in the Karsog Forest Division, nearly 100 *Mahila Mandals* are protecting the forests with the cooperation of FD.

Karnataka

In Karnataka, the government had taken the initiative to involve local people in forest management and in benefit-sharing. The state government in its Order in 1986 decided to share 50% of the produce on all lands with the *Mandal Panchayats* on condition that they would take care of the plantations after they were three years old and until harvest. A provision was also made to give half of this produce to small and marginal farmers and landless labourers at concessional rates. Subsequently, in April 1993, an order establishing JFM was passed by the state government. According to this Order, degraded forest land having canopy cover of 25% or less, non-forest government wastelands, roadsides, canalsides, and foreshore of tanks would come under JFM. The first Village Forest Community (VFC) of the state was formed in September 1993 at Talagadde village in Kaewar Division. Nearly 216 VFCs are now active in Uttara Kannada Circle of the state. A memorandum of understanding has been signed with 125 VFCs. Between 1993 and 1997, plantation was done on nearly 6824 ha (Saxena *et al.* 1997).

Madhya Pradesh

Following the issuance of JFM Notification by GoI, the state government of Madhya Pradesh proceeded with an order in December 1991 to bring forest areas sensitive to damage under joint planning and management. Within half a decade, 2000 FPCs have become active in southern Madhya Pradesh (Poffenberger *et al.* 1996). The specific characteristic of VFPCs in Madhya Pradesh is that one seat in the Executive Committee (EC) is reserved for a village school teacher. Harda Forest Division in Hoshangabad district of the state degraded badly due to overgrazing and extraction for fuelwood. To regenerate this forest patch, FD contacted the villagers and by March 1992, 75% of this area regenerated as a result of the protection offered by 150 FPCs (Poffenberger *et al.* 1996). In another instance, forest officials under the leadership of the Divisional Forest Officer (DFO) in Jhabua Forest Division in western Madhya Pradesh motivated the people of the area to participate in forest protection and regeneration activities. Started in 1992, 20 000 ha of severely degraded Jhabua forest came under protection of 15 formal and a large number of informal VFPCs. Here FD has taken an integrated approach to implementing JFM, adding components like construction of stop dams, hand pipes, small decentralized nurseries, fisheries, and environmental forestry. Although JFM in Madhya Pradesh started late, the awareness among people about forest protection is very high. The extent of the people's willingness and involvement is evident from the fact that one VFPC of Jhabua was successful in persuading eight encroachers to vacate forest lands peacefully, something the FD could not do for years (Poffenberger *et al.* 1996).

Orissa

Various micro studies on participatory forest protection in Orissa reveal that community-based forest protection in its organized form began in the 1940s. The community initiative to protect forests from deforestation lasted for more than 40 years, and in August 1988, the state government through a resolution assigned a specific role to the local community in the protection of peripheral RFs. In essence, this was the beginning of JFM in Orissa. Later on, the government through a modified resolution in December 1990 brought PF too, under this scheme. In July 1993, the government issued another resolution to rectify the shortcomings of the earlier resolutions. As a result nearly 23 000 official FPCs have been formed in all districts of the state with the greatest concentration in Dhenkanal, Mayurbhanj, Koraput, Sambalpur, Puri, Baingir, and Sundergarh (SPWD 1992).

Uttar Pradesh

Participatory forest management in UP, which is known as the *Van Panchayat* System (VPS), was born out of conflict and compromises following the settlement and reservation of forest in the hills, at the turn of the century. These restrictions brought real hardship to the people and several social movements started in Kumaun. As a result, a statutory committee was formed and it recommended reclassification of forests and formation of *Van Panchayat* (VP) to manage the forest in areas where discord was high. Subsequently, the recommendations were revised in 1972 and 1976. In VPS, the management of these forests was done by the people under the supervision of the District Magistrate. Till the end of 1985, a total of 4058 VPs had been functioning in the district (Gadgil, Guha 1995).

The administrative powers of VPs were vested in the Revenue Department while technical functions were bound with the FD, leading to growing resentment of the people and large-scale mismanagement of affairs. The UP State Government has issued JFM Notification very recently. Although it is a formative stage of JFM, the contents of the Notification have created some major controversies. The guidelines expect the local people to 'fully protect' the core area but limit the benefit-sharing from fringe areas only. UP, like Gujarat, also has kept the provision of wage employment to two members of each family on a continuous basis. This exercise is likely to be counter-productive as it does not give people the sense of being shareholders in the forest produce, therefore, this interest will be limited to gaining employment and not the protection of the environment.

West Bengal

The inception of JFM in West Bengal could be traced to 1970s. From 1960 to 1975, due to population increase and lack of awareness, forests were mishandled by people for their subsistence needs. The need for forest protection was felt by the people when degradation reached a point where the forests were unable to satisfy even the basic needs of the people for food and fuel. At the same time, realization of the limitations of custodial forest management was the turning point when forest officials understood that without sharing responsibility and power with 'ecosystem' people it is impossible to protect forests (Gadgil, Guha 1995). Subsequently, the West Bengal Subordinate Forest Service Association was formed in 1979 with a mission to acquire confidence and mobilize support of ecosystem. Meanwhile, the success with the Arabari experiment generated confidence among the people and FD, and also became a model for forest protection with people's cooperation. All these changes were favoured by the pragmatic Land Reform Policy and successful implementation of the three-tier *Panchayat* system of the communist government of the state.

Pursuant to the success of the Arabari experiment in 1987, the FD issued first Participatory Forest Management Order and brought south West Bengal forest under participatory management. This Order was further modified and elaborated by the state government in 1989 and 1990. Later, in 1991, the state government issued three orders to include north Bengal plains, Darjeeling hills, and Sunderban areas under JFM. By 1995, JFM spread to 423 825 ha of PF area with 306 545 members in 2745 FPCs (GoWB 1995).

Role of NGOs and donors in JFM

NGOs

The need for NGO involvement in forest management activities are widely felt by the government. This was reflected in the announcement of Forest Policy 1998. According to this policy, committed voluntary agencies/NGOs, with proven track records, were well suited for motivating and organizing village communities. They could also be associated as an interface between SFDs and the local village communities for revival, restoration, and development of degraded forests. The inception of JFM, in a way, was not only a concern to save the forest ecosystem but at the same time it was a recognition of the life and liberty of forest dwellers and how their survival was closely intertwined with the survival of the forests. Thus an agency was needed to make people conscious of their social, political, cultural, and economic existence *vis á vis* the forest. For the government, it was just not possible to fulfil this goal due to poorly motivated, inadequate and otherwise occupied staff in the rank and file of the FD. Political parties too could not do this because of the diversified political goals. The only option then were NGOs, who had the required level of commitment, rapport with the people and identification with participatory ideals and objectives, that was needed to fill this niche.

The work mainly undertaken by NGOs in different states may be divided into the following categories:

- building awareness among the people by organizing meetings, environment education camps, etc.;
- acting as supporting agent in the implementation of JFM and also playing an interface role by conducting technical extension work to support different income avenues for local people;
- organizing training programmes for FD staff (senior officers as also field staff) as well as for members of the FPCs to orient them towards participatory forest planning and management; and

- undertaking research regarding social, economic, and ecological issues and carrying out process documentation thereby helping to provide feedback to facilitate the process of transition to move mature, independent institutions.

Donors

In India, the World Bank has played a key role in supporting and funding the JFM programmes. The Ford Foundation has made a major contribution to the evolution and establishment of the JFM in India by supporting a number of NGOs and individual researchers working on JFM across different Indian states such as Haryana, Gujarat, Orissa, Rajasthan, and Madhya Pradesh. The ODA and Swedish International Development Authority have also provided substantial loans to several Indian states for JFM. The JFMPs West Bengal and Andhra Pradesh are being funded by the World Bank, while those in Karnataka and Himachal Pradesh are funded by the ODA.

The role played by eminent donor agencies by way of financial assistance and legitimacy provided to JFM has proved to be of immense importance. The donor agencies have been able to provide a common platform for interaction between FDs, NGOs, researchers, and villagers from areas where JFM is being implemented. These fora have facilitated the different actors to interact, exchange, and share ideas, experiences, research methodologies, etc. within India and at an international level. An important outcome of such an interaction has been an identification of the need to adopt *process* rather than a *project* approach to implement the JFMP.

Because of the strong donor involvement, there has been a perceptible change in the manner in which JFM has been introduced in most states and the way JFM has been received by people. One of the drawbacks in the process has been the capital-intensive international assistance provided to certain SFDs of late for JFM. This has led the people and the FD staff to view JFM as just—another project rather than what it really is—a progressive transition to a decentralized management of forests with a view to establishing a strong and healthy relationship between 'ecosystem people' and environment. The project-based approach, which is a rather short-sighted perception of the progress, be it from the people or the FD staff's points of view, checks the spontaneity of social change. The result is the reversion to *status quo* prevailing in the pre-programme phase, on withdrawal of support to the programme.

There thus emerges a strong need for the NGOs and donor agencies who are involved in the JFMP to pay attention to spreading awareness at the grassroots level amongst local communities of their rights and duties towards forest management. These communities have to develop independent, self-sustaining, long-term institutions that will support the new JFM paradigm, and must be made aware of the fact that JFM is here to stay as a decentralized forest management approach. Continuous interaction and dialogue amongst local communities, forest administration, and planners, where all of them figure as equal partners in the JFM process, is pertinent to the successful implementation of JFM in India.

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Evolution of Joint Forest Management in Haryana

Introduction

This chapter attempts to document the various initiatives directed towards ameliorating the degraded forests of Shivaliks through collaborative efforts between the state and the local forest-dependent communities.

The Shivaliks

The past systems of forest management in Shivaliks have recognized the degradation that has become endemic to the forest due to the increasing pressures. The Himalayan foothills of northern India cover about 2 mha in three states, namely Punjab, Haryana, and Himachal Pradesh.

The history of Shivaliks is linked closely to the political history of India and its economic development. The Shivalik hill ranges or the sub-Himalayan zone forms a continuous chain of mountains spread over 2400 km from the Indus to the Brahmaputra. The area is believed to be a part of the first permanent settlement of Aryans in India and the cradle of ancient Indian culture and civilization. The Chinese pilgrim of the 7th century, Huen Tsang, records this area as a place of knowledge and wealth. In the *Mahabharatha* there is a mention of *Sindhu-ban,* a forest extending from present-day village Kathgarh to Mustafabad and on both sides of the *Saraswati* river.

Known to be a rich tract of land during the Mughal period, this area was considered as a stronghold of the *Pathans*. It was invaded by the Sikhs after the defeat of the imperial governor of Sirhind in 1763 AD and was divided amongst *jagirdars*. The local chieftains managed the areas under forest as shooting blocks which were strictly closed to grazing and lopping of trees. This closure resulted in a cover of trees and grass, ensuring the preservation of the natural habitat of wild animals.

British period

Before the reign of Mughals, the *rajah* was the manorial lord of his territory. The estate (*mahal*) was divided into blocks (*mauzas)* for administrative purposes. All wastelands were the property of the *rajah;* every right was supposed to come from the *rajah;* holding of land was derived from his grant; and the user of the wasteland was dependent on his sufferance. The land tenancy was of two kinds—proprietary tenants (*mastet muzaras*) and tenants-at-will (*ghair maurusi muzara*). Proprietary tenancy was hereditary, wherein tenants could not be evicted, whereas the tenants-at-will could be evicted by the landlord. The former paid a fixed royalty, which varied according to the quality of land, plus the assessed land revenue to the landlord. In addition to the royalty, he would also pay one-half of the produce in kind.

The forests of Shivaliks came under the British administration in 1806, with the aim of providing large-sized timber to the royal navy. However, in the period 1815–60, the state had practically no control over most of the forests. In the land settlement of 1822, agriculture was given precedence over conservation of forests. Thus large areas were cleared for cultivation. The hill sides were divided among the villages in the hills, and the forest produce was declared as village common property. As forests provided excellent grazing areas and agriculture was labour-intensive and unremunerative, large herds of cattle were reared by the people. Sheep and goats were sold in the market by the farm community. The open access to the resource led to severe erosion and aridity in the hills and poor agricultural production. This created a vicious circle of increasing degradation in the Shivaliks resulting in loss of productive top soil and overall forest productivity.

In 1860, Lord William Hay, Superintendent, Shimla Hill State, invited the Patiala Durbar to protect the forests. The forest areas were brought under the control of the Revenue Department (Civil Nizamat) during 1861–76. However, this led to large areas being clear-felled to meet the fuelwood requirements of the cantonments and civil hill stations. The land settlement work initiated by the revenue administration led to the declaration of all pasture (*shamlat*) forests as village forest. The declaration of these areas as village forests, without any work plan, led to an unrestricted lopping of trees and open grazing. This induced severe erosion and this increasing degradation led to rising frequency of floods and loss of biophysical resources.

G G Minniken's Settlement

In 1881, the Forest Department (FD) was separated from the Civil Nizamat and a regular forest establishment was organized. An attempt towards regular and systematic settlement of state forests was made in 1890 by G G Minniken of the Imperial Forest Service, who was deputed in 1890. He demarcated 1st and 2nd Class forests on the basis of their protection and production functions and prepared a working plan for these areas. The demarcation with attempts to restrict grazing in the forest area resulted in conflict of ownership and rights. Minniken allowed the right of cutting grass to the village community collectively. Subsequently, however, these pasture lands (*ghasnies*) came under the control of individuals rather than the village as a whole.

Punjab Land Preservation Act (1900)

The increasing conflicts in the sharing of resources and unabated degradation of the hill ecosystem resulted in a 30% loss in agricultural productivity. This necessitated adoption of the Punjab Land Preservation Act or the Choe Act (1900). This Act entailed the closure of the fragile areas to open/uncontrolled grazing and unrestricted lopping of trees. The Act annulled all the traditional rights of pasture and wood-cutting and conversion of forest lands for cultivation. However, lack of funds and rising conflicts between FD and the village community made the Act ineffective.

Later during 1914–16, the *Gujjars* were paid Rs 4 per sheep/goat as compensation by the government which banned goat and sheep rearing in the areas closed under Section 4 and 5 of Punjab Land Preservation Act. The damage caused by nomadic sheep, during the winter months, however, continued unabated. In 1916, Patrick Fagan, while describing the condition of the Shivaliks, stated that the Shivaliks were as barren as the mountains of the moon.

Forest Settlement of 1938

The Minniken Forest Settlement of 1892 was not formally sanctioned by the Patiala State. In 1904, a regular and systematic working plan for a period of 30 years was prepared by Mr Fazul-ud-Din, an officer of the Provincial Forest Service, based on the Minniken Settlement for 1st Class forests.

Mr Mian Budhi Singh, along with officials of the Revenue Department, took up revision of the Minniken's Settlement in 1938. He investigated the villagers' rights and revised the forest boundaries in consultation with the villagers, and forest and revenue officials. He undertook demarcation of the forest areas into Reserved and Protected forests, as it was felt that without proper demarcation the objective of revision of forest settlement would be defeated.

The revised forest settlement was based on the customs prevalent before Minniken's Settlement. 'The rights with restrictions and limitations as were admitted in the (Minniken's) forest settlement ...have been enjoyed by the people since then with such alterations and modifications as the circumstances of the later period suggested. Thus they have acquired legal status and can be claimed, as a matter of right, by the right holders subject to the restrictions and limitations (mentioned in the revised settlement). The forest rights have been generally allowed to the proprietors of the revenue paying land and their agricultural tenants and under the settlement, rights are appendant to cultivated land paying revenue and could be acquired only with such lands.' The rights were meant to satisfy the agricultural requirement and could be claimed as a matter of right for the bonafide requirement of the right holder.

As for the conflict between the local village communities and the FD, with regard to grazing in the forest areas, and the damage that has been caused due to unrestricted grazing, the settlement admits that this could not be compensated without incurring heavy expenditure. In this regard, the settlement, in consultation with the right holders, stipulated that the rights of grazing would continue in the forests with certain modifications to Minniken's Settlement. The bamboo forests were to be closed to grazing during the three months of rainy season in the interest of production of bamboo shoots.

On the basis of the grazing capacity of the forests, a limit was set to the number of cattle which might be grazed in the 1st Class forest. Arguing that the right of cutting grass to the village community collectively, specified under the Minniken's Settlement, is desirable, as opposed to granting rights to individuals' *ghasnies*, which could lead to social conflicts between dependants of the right holders, the 1938 settlement stated that the rights of grazing in 1st Class forest would be regulated by the issuance of a permit at a nominal fee. In the 2nd Class forest, the prescriptions of the government order of 1912, specifying rent on grass lands assessed as tax, would be charged.

Chos reclamation committees

In 1932, a special committee of the Legislative Assembly, convened under the chairmanship of Sir Miles Irving, Financial Commissioner, found that the basic cause of erosion was the disappearance of forests. The unofficial members of the Forest Commission, appointed in 1937 to enquire into the grievances of the public, realized the serious menace of soil erosion and recommended the creation of a special Soil Conservation Circle. As a result, in 1939, a special branch of the FD was created to undertake soil conservation measures in the forests, pastures, and the cultivated lands, throughout the northern districts of the then Punjab Province. In the same year, Ambala Soil Conservation Division was established to control soil erosion and to restore vegetation on the barren hill slopes.

Cooperative Choe (ravine) reclamation committees were organized. A catchment was selected as a unit of planning. Extensive soil conservation works like gully plugging, terracing, construction of earthen dams and bunds in small *nalas* (streams), planting of *Saccharum munja, Eulaliopsis binata, khair* and *shisham*, etc., were taken up to stabilize gullies, ravines as well as slips and slides. It was realized that strong support from the general public was essential for complete closure of at least 50% of all critical forest areas and for undertaking soil and water conservation and land reclamation measures in such closed areas. Therefore, the government followed the policy of persuading the people for voluntary closure of forest areas. All the affected areas were put under Protection Working Circle in various working plans, prescribing afforestation, soil and water conservation measures and strict closure to grazing. The FD undertook plantations along the stream banks. The areas closed to sheep and goat grazing under section 4 of the Chos Act were effectively protected.

A special publicity officer was appointed who toured the state, giving lectures, exhibiting slides, etc. Simultaneously, large-scale demonstration of correct methods of terracing, embanking, and drainage, etc., was taken up. Pamphlets written in simple local languages were widely distributed and many articles were published in the newspapers to bring about general awareness regarding the seriousness of the problem of soil erosion.

However, by 1942, the progress slowed down and the government decided to compulsorily close these areas under section 5 of the above Act. There was strict closure of the forest area to open access livestock grazing. Afforestation, and soil and water conservation measures were adopted. Thus, there was a controlled access of the community to the natural resources which resulted in escalation of conflicts between the FD and local communities on the usufruct rights in the forest area for fuel, fodder, pasturage, etc.

Evolution of participatory management

After Independence, with the advent of the Five Year Plans, measures for protection and improvement of forest areas were taken up on a more extensive scale but areas could not be closed effectively. Increasing human and livestock populations put tremendous pressure on natural resources, resulting in deforestation and degradation of many areas.

In 1948, due to the creation of Patiala and East Punjab States Union (PEPSU), the control of these forests came under the PEPSU government. On the merger of PEPSU with Punjab on 1 November 1956, the forests were managed by the Punjab FD till 31 October 1966. On 1 November 1966, Haryana was formed after reorganization of Punjab state and since then forests of Haryana have been managed by the Haryana Forest Department (HFD).

The seriousness of the problem of soil erosion in the Shivaliks came into sharp focus in mid-70s when deforestation in the catchment (Shivaliks) of Sukhna lake was causing serious problems of siltation of the lake. The rate of erosion in the catchment was nearly 700 tonnes per hectare per year with 70% of the rainfall lost as run-off from the catchment. Various engineering and vegetative measures became ineffective in the wake of lack of people's cooperation in maintaining these measures. This led to the evolution of participatory approach to forest management by enlisting people's participation in the protection and management of forests jointly with the HFD. The strategy adopted for obtaining the willing cooperation of the local people was the construction of water-harvesting structures to provide irrigation water to rain-fed agriculture, increasing yields by two-to-three times. This proved very effective in soliciting the participation of the local communities. This strategy captured the attention of the farmers and gave a new direction to the concept of watershed rehabilitation. This experimental programme, started by the Chandigarh Centre of Central Soil and Water Conservation Research and Training Institute (CSWCRTI) and the HFD in Sukhomajri watershed, and successfully replicated at village Nada, was designed to achieve increased productivity and effective resource conservation. The villagers cooperated in protecting the catchment area. Water, stored in earthen dams, was distributed equally among all households, irrespective of land ownership, helping communities to gain confidence in the participatory management approach. For effective distribution and management of stored water for irrigation, Water Users' Association (WUA) was formed in Sukhomajri and Nada.

Benefit-sharing

In addition to the protection provided to the forest areas, the catchment was treated by constructing silt detention structures and plantation of trees and grasses. The general belief that long gestation periods are needed before *bhabbar* grass can be harvested was invalidated in Nada where the grass was harvested within the year of its plantation. The grass productivity increased from 40 kg to 2000 kg per hectare by 1986, in addition to an increased tree cover. For sustaining the interest of the villagers in the protection and management of the forest, it was considered essential to share the increased productivity of forest produce between the HFD and village community. For this purpose, the WUAs were reorganized into Hill Resource Management Societies (HRMSs) registered under the Societies Registration Act (1860). The major responsibilities of HRMSs are: (1) protection of forests against grazing and illicit felling; (2) distribution of irrigation water; (3) fixing of rates for water, grass, etc.; (4) maintenance of dams and conveyance systems; (5) maintenance of accounts; and (6) cooperation and interaction with the staff of the FD. All adults of all families in the village were free to become members of the society, thereby sharing equal rights and responsibilities. The improved management practices and changes in attitude of villagers led to the leasing of forest areas to registered HRMSs by HFD. The societies paid the average price obtained in the last three open auctions with an annual increase of 10%. This resulted in the reduction of rates for grass cutting from Rs 450 per head per year, charged by the contractor, to Rs 150 per head per year charged by the HRMS. Hence, the interest of individual members of the HRMSs was ensured.

Programme expansion

After over a decade of experimentation in the villages of the Shivaliks, the HFD developed a number of strategies to enlist the participation of village communities in forest protection and management. From 1983 to 1988, the programme was extended to new areas with the construction of 54 water-harvesting structures in 39 villages. While these strategies effectively motivated the communities to establish *social fencing* and other protection and management systems, the programme did not spread effectively to other areas. Due to limited institution-building capacity within the HFD, only 20% of the 39 communities were able to establish HRMS and irrigation facilities and 18% could gain grass leases from the SFD. The cooperation between the FD and village communities was not as effective as in Sukhomajri and Nada villages. Before the construction of new dams, communities' commitment to protection of forests, and a definition of rights and responsibilities, were overlooked. Another factor responsible for ineffective expansion of the programme was the absence of a clear policy and guidelines regarding benefit-sharing.

People's Rights in the Forests of the Haryana Shivaliks: a Historical Perspective

Introduction

The lower Shivalik hills, which cover the states of Himachal Pradesh, Punjab, and Haryana, lie in the sub-montane ecological zone. This zone had large tracts for grazing which supplemented the resources of (1) the common lands of the villages in the tract, (2) the short and long fallows of the riverian and the plains, and (3) the grazing alps of the upper ranges of the Kangra. The grazing fallows of the sub-montane had two unique characteristics. Firstly, the long fallows were located in forests, which were, in turn, held under common control—the *Shamlat Ban*. Secondly, the village forests were cultivated patches and grazing on both the crop stubble and grass fallows was shared by the villages with the nomadic *Gujjars and Gaddis*.

In 1961, it was estimated that over 1500 square miles of Shamlat forests were still in existence in the lower Shivaliks (Chakravarthy-Kaul 1996). The isolation of these forests and their dissection by rivers, flood plains, and low-lying agricultural fields make monitoring problematic, and illicit use possible. The erratic rainfall, extreme temperature, and unpredictable river flows of the Shivalik mountain range require that the vegetative cover be retained to help maintain the ecological balance.

Property rights regimes in the Shivalik hills

Traditionally, three types of property rights regimes existed in the Shivalik hills of Haryana (Civil Writ Petition No. 5877 of 1992 in the Haryana and Punjab High court).

1. *Private property.* Private property was in the possession of the owner.
2. *Private common lands.* These were lands reserved by the proprietary community for their common purposes. These could be communally held in the plains or in the hills.

3. *Village common land.* These lands were reserved to be enjoyed by all residents of the village irrespective of their proprietary interests in it or in village holdings. These included pastures, ponds, pools, and reservoirs.

Shamlat Ban or village forest land is a generic term used to denote communal forest land. The ownership of these lands could be vested in either a group of land-holders *(Mushtarka Malkan)* or with the village as a whole (*Shamlat* or village *Panchayat*). In the instance of the forest area being under the ownership of a group of landlords, a distinction is made between proprietors and non-proprietors. Proprietors were those who hold land on which revenue is assessed. Proprietors were entitled to a share in the *Shamlat Ban* in proportion to the land revenue paid. A vendee may sell his share of the *Shamlat Ban;* it was not appended to his share in the *Khewat* holding (land on which revenue is paid). Non-proprietors on the other hand had a limited right. They, for instance, had the rights of grazing.

However, the passage of several legislations, and in particular the Punjab Village Common Lands Act of 1961 and the East Punjab Holdings (consolidation and prevention of fragmentation) Act of 1948, obscured the distinction between common lands held by a group of landlords with limited use rights granted to non-proprietors (*Mushtar ka Malkan*) and the village common lands under the management of the state *Panchayat* which were used by all residents of the village regardless of their proprietary status (*Shamlat/Panchayat*). It got established that all persons had a share in the *Shamlat Ban* regardless of their holding in the *Khewat*. This was one of the most important reasons for the transformation of *Shamlat Ban* from a communal resource with limited access to an open-access resource with limited restrictions on use and access. Resource degradation associated with open-access use was hoped to be reversed by advocating a greater role for the forest department (FD) in forest management.

Management of *Shamlat Ban*

The management of *Shamlat Ban* was intrinsically linked to the land-use pattern that prevailed in the Shivalik hills. Land-use was characterized by an arrangement of fallows over time and space. Variation was determined by, first, the location of the village in relationship to the immediate tract and to the eco-region at large; and second, the extent of emphasis on arable as opposed to pastoral use. The arable fallows were arranged by two sets of institutions, *Khet bat* and *Chak bat*. *Khet bat* was an institutional device for 'scattering', whereby the land of the village was broken into large fields or *hars*, each being given a name. The *har* had similar traits of soil, moisture, and vegetation cover and each of these was further divided into lots, according to the number of shareholders, which were allocated by a lottery. The *Khet bat* method ensured that each share consisted of a few *bighas* or perhaps a fractional part was made up of *rabi* or *kharif* acreage, pasturage and firewood land, etc. This assured a measure of equal access to all the varieties of land available in the village and, therefore, involved a sharing of both risk and uncertainty.

Scattering was an institutional device to provide insurance to individuals against uncertainty, provided they cooperated. In yet another way, scattering, with compact grazing, acted to reduce risk when collective responsibility for regular payment of the official land revenue was enforced; and, at the same time, pressurized individuals to be responsible to collective liability. In the case of the *Chak bat* mode of land distribution, each shareholder received a compact block. The entire land of the village was divided without strip scattering.

Customary institutions began to lose their resilience in the face of colonial policy, which penalised excessive area kept as long fallow through imposition of a higher revenue rate. The official policy of permitting cultivation in the long fallow pressurized the commons by initiating a movement from the pastoral to the arable use of land. Official state policy also permitted the partition of village common land. In particular, the revenue and judicial departments of the colonial state made a significant impact in shaping resource management regimes in north-west India. This is evident from the fact though revenue collection continued to be based on joint revenue responsibility, revenue records maintained that recognition was given to individual right holders in the land for which revenue was paid. Therefore, there emerged over the course of the 19th century, distinct identities of the individual against the group, of the family within the clan, and of the clan within the tribe.

Settlement policies

The settlement policy of the colonial regime also brought to the fore the distinction between two classes of land owners. They were the proprietors and the occupancy tenants. The settlement provided occupancy tenants with a share in the *Shamlat rights.* Though limited, these rights were secured to occupancy tenants on a permanent footing in the village by the Punjab Tenancy Act of 1868. In addition to the occupancy tenants, the British also created a second rung of proprietors—the *Malik Makbuza* (owners of land without rights to the commons). By simply granting a legal status, however, to this category of land owners without any share to the *Shamlat* income or rights to the *Shamlat*, a basis was created for disputes over the use of common lands.

There was a visible shift in colonial government policy by the last quarter of the 19th century. This was evident from the enthusiasm with which the government went about the task of creating reserves of forests and grasslands. This shift in policy away from the one which encouraged sedentary agriculture on land outside the boundary of a revenue village coincided with the increasing capacity of the state to overcome institutional hurdles. From 1860s to 1890s, railway extension dictated the government policy. Although, the railways had by then shifted from charcoal to mined coal, timber was required for railway sleepers. The shift in policy is further evident from the manner in which the government assigned an increasing proportion of the land at its disposal to forest land, labelling the rest as 'unassigned' (Table 1).

In 1859/60, forest and waste accounted for 28% of the total land held by the government; by 1868/69, the proportion taken by forests increased to 90% of the total land. Besides forests, the government had property in valuable trees, and it was the official understanding, as of 1869, that 'people do not have the right to cut down trees in order to cultivate, i.e., even if the plot on which the trees stood was not demarcated forests' (Kaul 1996). Government regulations like Sections 4 and 5 of the Punjab Land Preservation Act of 1900, which are still in operation in many parts of modern Punjab and Haryana states, have a striking resemblance to such policies which influenced the use of forest products.

Districts in the sub-montane region saw a large amount of forest land demarcated between 1848 and 1870–72 and then reserved in 1879 by the government. Later on, as was the case in Gurdaspur district in 1910, the government assumed the management of communal forests or *Shamlat Ban*. The partition of common land in villages also became possible because of the encouragement provided by colonial government policy. The Land Revenue Act of 1871 confirmed the settlement of 33 020 village communities in the old Punjab state, which consisted of the states of Haryana, Himachal Pradesh, and Punjab. In the process, the Act also classified the tremendous variety of tenures into three standard types according to the manner in which the revenue (*bach*) was distributed among the land-holders and 'the extent to which common ownership of the village lands' prevailed.

There were essentially two principles of ancestry and possession by which communities in the sub-montane districts managed their individual and joint assets (Table 2). They were the *Bhaiachara* and *Pattidari* tenures. The *Pattidari* tenure referred to the joint ownership of a village or estate held on ancestral tenure. The *Bhaichara* tenure referred to a group originally descended from a common ancestor, holding lands or certain rights and privileges in common. But by and large, the distinction between the *Pattidari* and *Bhaichara* tenures rested upon the fact that ancestral shares were used in the former but not in the latter. In the *Bhaichara* tenure, partition of the *Shamlat* was by the principle of *hasab rasad raqba khewat*, or according to the proportion of land revenue paid by the holder of a *khewat*.

Although settlement operations were responsible for creating the conditions that encouraged the partition of village common lands, there were communities

Table 1. Land at the disposal of the government (acres)

Land	1859/60	1868/69
Forest and wastelands	2312260	8317075
Culturable	5196779	—
Cultivated	3596	—
Unculturable	751014	—
Land leased and sold	—	13305
Total	18263649	8330380

Note. Figure modified so as to add up
Source. Chakravarthy-Kaul (1996)

Table 2. Tenurial institutions in the old Punjab state

Tenure	Modes of sharing		
	The *bach*	*Shamlat* income	*Shamlat* land
Zamindari khalis	Single	Single	Single
Mushtarka	Communal or ancestral shares	Ancestral share	Ancestral share
Pattidari mukammil	Ancestral shares	No *Shamlat* income	*Shamlat*-deh partitioned
Na-mukammil	Customary or ancestral	Customary or ancestral	Customary or ancestral
Bhaiachara mukammil	Actual possession	No *Shamlat* income	*Shamlat*-deh partitioned
Na-mukammil	Actual possession	Ancestral share or actual possession	Ancestral or customary share or actual possession

Source. Chakravarthy-Kaul (1996)

which forbade the partition of common lands, particularly in districts that were predominantly pastoral. Such communities were bound by the clauses of *Wajibularz* to the effect that the 'whole or a definite portion of the common land should not be considered liable to partition, but should be kept under common property, for the grazing of cattle of the whole community.' A further provision was that 'villagers could restrain individuals from breaking up the jungles by invoking the Punjab Land Revenue Act, and were assured of all assistance from the authorities in this important matter'.

People's rights in government forests

Settlement operations did not necessarily always take away the rights of the people. Minnikens' Settlement (revised) of 1937/38, for instance, granted the community rights of cattle grazing, grass cutting, and wood for fencing (Table 3). The other rights granted included the right to extract firewood, wood for making charcoal, wood for agricultural implements, and right of way for men and animals. These rights were granted for protected forest areas in villages in Shivalik hills of Haryana. Some of these rights continue to date and form a very important basis for the joint forest programme being implemented in the state today.

While rights were granted, the increase in population of both humans and livestock has taken their toll on the forests in the last few decades. Extraction of fodder grasses, fuelwood, and small timber to meet domestic requirements in an unsustainable manner took its toll on the forests. Further, the relationship of the forest custodians, the FD and the user-communities, was not very cordial and this also affected the forests. Added to this were instances where the FD had acquired forest lands along with the rights that the owners of the forests had granted to villagers. This was typically the case in Morni hills forest areas where

Table 3. Forest rights in the Shivalik hills of Haryana: revised settlement report of 1937/38

Forests (Number)	Name of the forest	Area (acres)	Right holding villages	Detail of the rights admitted in Minniken's settlement	Rights admitted in revised settlement of 1937/38
247/248	Burj and Baraghati	158	Gumthla	The right holders will exercise the following rights. 1. Grazing of cattle 2. Cutting grass 3. Firewood for all sorts of use 4. Wood for making charcoal 5. Wood for agricultural implements 6. Wood for chazrpal 7. Timber for construction with permission of the forest officer 8. Right of way for men and animals 9. Wood for fencing	Right holders will exercise the same rights as per details in Minniken's settlement under the new rules.
248/249	Gumthla	30	Gumthla	- do -	- do -
249/250	Chauki	254	Chauki	- do -	- do -
250/251	Nada	204	Nada with Bas	- do -	- do -
251/252	Rampur, Jhajra	25	Rampur Rajipur (Jhajra)	- do -	- do -
252/253	Dhamala, Lohgarh	156	Lohgarh Dhamala Rampur Seori	- do -	- do -
253/254	Charnian Basol (Basol Greran)	146	1. Majri 2. Khera 3. Sasoul 4. Greran 5. Kiratpur 6. Dhamala 7. Charian	- do -	- do -

the Mir was paid compensation by the government for acquiring the forest areas. The villagers were not compensated but their rights were extinguished.

Such acquisitions led to large-scale deforestation and mistrust. However, the coming of the Joint Forest Management Programme (JFMP) has led to resolving and rationalizing some of these issues wherein the basic needs of the people and the conservation needs of the forests have been taken care of. Thus, the rights of people have been upheld and the extractions from forests are on a more sustained basis so as to allow for their better management under JFMP to facilitate regeneration and protection.

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Area Profile

The Shivaliks form a belt of low-lying rugged hills of recent origin along the foot of the Himalaya, extending from the Brahmaputra valley on the east to the Potwar plateau and the Bannu plains (in Pakistan) on the west. This belt covers about three million hectares in the four north-western states, namely, Haryana, Punjab, Himachal Pradesh, and Jammu and Kashmir; and extends over about 400 km in these states, falling between longitude 75°35' to 77°30' E and latitude 30°10' to 32°30' N. The distribution of area under the Shivalik belt in Haryana, Punjab, and Himachal Pradesh is given in Table 1.

The Shivalik range is divided into a series of transverse ridges and spurs separated by valleys of varying widths. These hills are characterized by extremely rugged and broken-up steep slopes, serrated outlines, and sheer precipices 70 m or higher, standing out sharply at places. The elevation varies between 280 and 1500 m above mean sea level. These hills merge into the Himalaya to their North and the Indo-Gangetic plains to their South.

Hilly torrents (called 'Choes' locally) are a peculiar feature of the drainage system in this tract. These seasonal streams have narrow and deep valleys with a steep gradient in the hills; bring flash floods during monsoon; carry heavy bed load; get wider and shallower as they emerge from the hills; and deposit coarse sediments like boulders, pebbles, and sterile sand over agricultural land in the plains. About 107 major and medium size 'choes' emerge from the Shivalik hills and criss-cross the 'Kandi' (foothills) road connecting Yamunanagar in Haryana to Pathankot in Punjab. Sirsa, Ghaggar, Tangri, Markanda, and Yamuna are the major streams draining the Shivalik tract of Haryana. Drainage density in the hilly catchments is high and retention of water is generally very low during most

Table 1. The distribution of area under the Shivaliks in the three north-western states of India

State	Area under the Shivaliks (km^2)	State area (%)	Shivalik area (%)
Haryana	2889	6.5	14.5
Punjab	5338	10.6	26.8
Himachal Pradesh	11709	21.0	58.7
Total	19936	13.0	100.0

of the year. There is a scarcity of drinking water during summer months and people in many places migrate to other areas along with their livestock in search of water and fodder. Groundwater is generally very deep, except near the perennial streams and some valleys.

Physiography

The Shivalik hills were formed by the later Himalayan tectonic upheavals during the middle and lower pleistocene periods. Geologically, the Shivaliks are made up of alternating beds of sandstone, grits, conglomerates, pseudo conglomerates, clays and silts having the characteristics of fluviate deposits of torrential streams and floods in shallow fresh water basins. The area is mainly composed of tertiary sediments forming low parallel ridges with south-facing escarpments.

The rocks are young, soft and friable, and are highly susceptible to erosion. The clay minerals are illite, chlorite, and kaolinite with quartz and feldspar traces. Pink-to-brownish red silts and clays are dominant mostly in Haryana Shivaliks, whereas coarse sediments with predominance of sandstone are more common in the Punjab Shivaliks. The cementing material in the sand rock is calcareous sometimes. Limestone occurs in pockets as a capping over the hills. The outer range of Shivalik hills consists mainly of a soft, massive, greyish-white sand rock, interspersed with subordinate orange and pinkish clays. Thus, overall the Shivalik range comprises regularly banded alternating layers of variable thickness of grey and dull-grey fine-grained sandstone, conglomerates of assorted pebbles and rounded boulders; and variegated clays of red, pink, grey, and yellow colours. The Shivalik range has been involved in the later phases of the Himalayan orogeny, as we often find that the banded layers of deposits are folded, faulted, overthrust and lying at steep angles against other formations.

The soils in hilly watersheds of most of the Haryana Shivaliks are silty clay and silty clay loam. The soils in the agricultural plains are deep, with the surface slope varying from 1% to 15%, but the slopes near the foothills contain pebbles and boulders. The agricultural lands are generally loamy sand to sandy loam on the surface and tend to be slightly heavy in the lower layers. The moisture and nutrient holding capacity is low. The soil pH varies from 7.0 to 8.5 in agricultural fields and 5.9 to 9.5 in hilly watersheds. There are patches of heavy soils in the hills which are calcareous and alkaline, but the general range of pH in the forest areas is between 7.0 and 8.0. The Shivalik soils are generally deficient in nitrogen and organic carbon, phosphorus is medium, and potassium is generally high. The concentration of soluble salts is generally low.

Susceptibility to soil erosion

In the absence of adequate vegetative cover in the Shivaliks, it is mainly the inherent soil properties which govern the extent of soil erosion in the region. In the hilly watersheds, the shales, the clay formations, and the sandstones occur side by side in horizontal and vertical bands, and due to huge variation in their nature and properties, there is lack of cohesion and heterogeneity in strata which causes landslides, slips, and potholes, leading to the release of vast amount of sediments. Moreover, due to lower permeability of silty soils, and very poor retention of moisture by sandy soils, the establishment of vegetation is a serious problem in these areas.

The contact between the sand and clay bands is sharp. During rainy season, when these formations become saturated, clays expand whereas the sands are not too affected (due to difference in their coefficients of expansion), and during dry season when clays contract, the clay–sand contact becomes a weak zone, more vulnerable to erosion and landsliding. At some places, displacement also takes place along this contact. This leads to the falling down of the clay beds whereas the sands, which are more consolidated and resistant to weathering, remain intact. Whatever erosion of sand layers that takes place is due to peeling off or flowing out of the lower clayey units, which creates instability in the outer face of the upper sandy units.

Undercutting of hill-sides and stream banks by high velocity detritus-laden gushing waters of hilly torrents results in displacement of large quantities of soil to downstream areas. Vertical gully and ravine-like erosional features are, therefore, quite common in the Shivalik hills. The land slips caused due to undercutting of hill sides by flowing water is the major contributor of heavy sediment load in the seasonal streams. The detritus carried by the flash floods is deposited over productive agricultural fields year after year making them unfit for cultivation. The communication network is frequently disturbed, not only causing inconvenience but require repeated heavy investment. Biological factors like deforestation, uncontrolled grazing, and frequent fires further aid the menace of excessive soil erosion, landslides, and slips in the Shivalik hills.

Climate

The climate of the Shivalik region is sub-tropical with humid to semi-arid conditions prevailing under different micro situations. The area receives an average annual rainfall of 1116 mm, ranging from 716 to 1897 mm. The rainfall is bimodally distributed with about 886 mm or 79% of the total rain falling during three monsoon months of June to September and about 164 mm during winter season of November to March. Rainfall fluctuations are higher during the month of September. Winter rains are most erratic and ill-distributed. An analysis of the rainfall pattern of the region shows that there is only 38% probability of the area receiving an annual rainfall in the range of 1100–1300 mm. There are about 21% chances of the rainfall being less than 900 mm, and about 7% chances of its being over 1500 mm annually. Showers of long duration and high intensity (135 and 105 mm per hour for 15 and 30 minutes duration) are common, which lead to the problem of soil erosion. Hailstorms occur during March–April. Droughts are common, with a severe drought occurring every five years and moderate droughts on alternate years.

The summers are windy, hot, and dry with temperature shooting up to a maximum of 47 °C (during May–June). The winters are cold with temperature dropping down to less than 1 °C in January. Diurnal variations are high and frost is common during January–February. The average annual evaporation is 2300 mm with an average of 5.7 mm per day. Relative humidity in the afternoons goes down to 25% in May–June, rises to about 80% during August–September, and drops to about 40% in October–November.

Vegetation

The variation in the soil type and the rainfall patterns is reflected in the forest types present in the Haryana Shivaliks. Among the major types of forests are the Shivalik *chir pine* forest, tropical dry mixed-deciduous forest, dry deciduous scrub forest, *Dodonea* scrub, and dry bamboo brakes. The Shivalik *chir pine* forests occupy the higher reaches (above 1000 m elevation) of the Shivalik belt, particularly so in the merging zone of Himalayan ranges. Chir pine (*Pinus roxyburghii*) is the predominant tree species and is mixed in varying degrees with miscellaneous species like Khair (*Acacia catechu*), Jhingan (*Lannea coromandelica*), Kachnar (*Bauhinia spp.*), Tun (*Toona ciliata*), Amla (*Emblica officinalis*), Sandan (*Ougenia oogenesis*) Amaltas (*Cassia fistula*), Bhimal (*Grewia spp.*), and Kainth (*Pyrus pashia*). The *chir pine* crop tends to be pure on sand rock formations like quartzite and sandstone.

Among the most common types of forest in the area are the tropical dry mixed-deciduous Forests, wherein, numerous miscellaneous hardwood species are mixed together in varying proportions. Density is poor on spurs and precipitous slopes, while forests are well stocked over relatively gentler slopes as well as in sheltered valleys. The stocking improves on northern aspects, whereas the cover is poor on southern and western aspects. Blanks are common on precipitous slopes which are generally occupied by grasses like *bhabbar* (*Eulaliopsis binata*), Dholu (*Chsysopogon fulvus*), and Seriala (*Heteropogon contortus*). Natural regeneration of all the valuable species is almost missing due to a high incidence of grazing and fires.

The tree crop consists predominantly of miscellaneous species like Khair (*Acacia catechu*), Chhal (*Anogeissus latifolia*), Reru (*Acacia leucophloea*), Phulahi (*A. modesta*), Jhingan, Tun Chamror (*Ehretia laevis*), Siris (*Albizia spp.*), Tendu (*Diospyros melanoxylon*), Kanju/Papri (*Haloptelea integrifolia*), Bahera (*Terminalia belerica*), Sain (*T. tomentosa*), Harar (*T. chebula*), Dhak (*Butea monosperma*) and Sandan. The species like Sisham (*Dalbergia sissoo*), Jamun (*Syzygium cumini*), Kikar (*Acacia nilotica*), and the Kans grass (*Saccharum spontaneum*) generally come up on fresh alluviums along stream banks. Chhal tends to occur in groups on upper slopes having clayey formations.

Prominent shrubs found in these forests are Kuri/Har-Shingar (*Nyctanthes arbotristis*), Karonda (*Carissa spinarum*), Mehandar (*Dodonea viscosa*), Dhawi (*Woodfordia floribunda*), and Bansa (*Adhatoda vasica*). Thickets of Phooli (*Lantana *camara*) are now invading these forests from the fringe areas near roads, habitations, and hedges of the cultivated fields.

The dry deciduous scrub forests are a degraded stage of the tropical dry mixed deciduous forest. This type is found on the dry southern slopes, lower Shivaliks, and in the demarcated protected forests (near habitation) where there is excessive biotic pressure of grazing, lopping, fires, etc. Composition of species is similar to the above type, but the trees are stunted and malformed due to repeated lopping and hacking. Stocking is very poor and density is usually less than 0.4. Natural regeneration is absent. Shrubs like Lantana, Kuri, Karonda, Mehandar (*Dodonea viscosa*), and Bansa predominate in these areas.

The highly eroded and degraded forest areas, specially near habitation, have the Mehandar shrub growing in abundance and colonising these areas. Miscellaneous tree species like Reru, Phulahi, Khair, and Jhingan, occur scattered in the area in a stunted form. Ground cover is poor and natural regeneration of tree species is absent.

Bamboo (*Dendrocalamus strictus*) forests occur almost pure or mixed with shrub species on clayey loam to reddish brown soils intermixed with loosely textured conglomerate formations between 500 and 950 m elevation above mean sea level. These dry brakes of bamboos have clumps attaining best growth on northern aspects, in sheltered depressions, and on well drained slopes, where they form a canopied crop with little undergrowth. However, on exposed sites, bamboo clumps occur scattered, mixed with miscellaneous species, and are of poorer quality.

Potential for construction of water harvesting dams

The physiography, the climate, and the vegetation of the Shivalik hills provide a great potential for earthen dams for both soil conservation and water storage. As mentioned earlier, the inherent unstable geological conditions and poor vegetative cover in the Shivalik hills cause excessive soil erosion in the watersheds. About 60%–80% of the rain falling on these slopes goes out as runoff carrying with it heavy discharge of sediments in the range of 100 to 200 tonnes per ha (t/ha) annually. This leads to (1) the general degradation of the landscape, (2) flash floods, (3) destruction of properties, (4) siltation of reservoirs, (5) the widening of stream beds, (6) the deposition of detritus and sand on agricultural fields, and (7) the scarcity of water during dry summer months. Hydrological conditions in these watersheds are, therefore, highly unstable with the bulk of the high flows taking place during monsoon months and little or no discharge during the rest of the year.

Sub-soil water level in these areas is generally very deep, rainfall distribution is erratic; and in the absence of any dependable source of irrigation, agricultural production is very low. Water is the single most important limiting factor for the development of sustainable agriculture in the foothills as well as for the success of afforestation of the hill slopes. Soil and water conservation measures like contour trenching, gully plugs, check dams, grade stabilizers, debris basins and planting, etc. in catchment, and control of stream bank erosion in the lower valleys can go a long way in improving the hydrological conditions in this tract.

Studies conducted at the Soil Conservation Research Centre, Chandigarh, have shown that by adopting suitable vegetative and engineering measures, coupled with protection, the sediment discharge from eroded Shivalik watersheds came down from over 150 t/ha to less than 1 t/ha annually. The Sukhomajri experiment has shown that by constructing water harvesting dams in the hilly catchment, it is possible to harness the runoff water with advantage to both the catchment as well as the farming communities down below. A four-fold increase (from 1 t/ha to 4 t/ha) in the production of wheat crop could be achieved in the Sukhomajri village by recycling of runoff water collected in a water harvesting dam for irrigation of agricultural fields.

There are, however, very limited sites available for the construction of viable water harvesting dams in these hills. If the catchment is not well protected, the heavy sediment discharge coming with the runoff water usually silts up the dam reservoir in the first few years itself. Apart from the normal evaporation losses of 12%–21% from the open reservoir surfaces, about 70%–90% of the stored runoff water may get lost, in certain situations, through seepage into the sub-soil. Besides the hydraulic head (of stored reservoir water), the geologic strata and soil characteristics of the dam site have a dominant influence on the quantum of seepage losses in reservoirs. Sandy and loose conglomerate formations have correspondingly higher porosity and saturated hydraulic conductivity are responsible for higher seepage losses in many Shivalik areas.

Wherever the substrata is hard, more compact and impervious, seepage losses are low. Silt content, rather than clay, is inversely correlated to saturated hydraulic conductivity. If, apart from soil conservation and recharging of water table, the aim of constructing water harvesting dams is to provide irrigation to the agricultural fields down below, the selection of sites for the dams has to be done very carefully by taking the watershed characteristics as well as the dam site characteristics into consideration. Treatment and protection of the catchment has to form an essential component of the whole programme, and this would require complete cooperation and involvement of the local people.

A series of water harvesting dams have been constructed in the Shivalik range by state forest departments. This has helped in the recharging of the aquifer and the water table has risen, making it possible to install tube-wells in some such areas. The ponded water in the dam reservoirs becomes handy for pisciculture, thus providing additional income to the villagers. Local communities are now coming forward for active participation in the protection and management of their catchments. The improved moisture regime in the vicinity of water harvesting dams is becoming helpful for quicker restoration of the ecological balance in these watersheds. The construction of water harvesting dams, therefore, has a great potential for environmental conservation as well as for the economic development of the Shivalik tract.

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Socio-economic Profile of Village Communities

Introduction

To understand the Joint Forest Management Programme (JFMP) in its entirety, including its development and evolution, the setting up of people's institutions and benefit sharing mechanisms and conflicts over forest resources; one needs to gain a comprehension of the socio-economic profile of the study area one is talking about. The JMFP is essentially a people's programme, which necessitates an understanding of local socio-economic complexities, all of which are inextricably linked to the way the programme originates and evolves and in the types of institutions that develop. The Joint Forest Management (JFM) is meant to be location-specific, with solutions tailored to prevailing social, economic, and ecological conditions of the area. Therefore, obtaining socio-economic data helps to channelize the planning and implementation process at the grassroots level in a scientific manner. As part of the programme implementation process, socio-economic data have been obtained from the programme villages in the Morni-Pinjore and the Yamunanagar forest divisions. This chapter provides a scenario of the socio-economic situation prevalent in the project area.

Demography

The state of Haryana has an estimated population of 17.96 million (1995 figures), with an annual population growth rate of 2.8%. In comparison, the socio-economic data of Hill Resource Management Societies (HRMSs) in villages of Haryana are quite interesting. The quantitative side of the information in Appendix 1 shows that almost all villages under consideration are thinly populated and inhabited by a small number of families. Against the state's population density of 372 persons/km^2, the population density in the JFM area of 15 000 ha is 121 persons/km^2. Only two villages, namely Nanakpur and Surajpur, have populations crossing the thousand mark with the maximum number in Nanakpur (1757) comprising 267 families. On the other hand, the least populated village is Dulopur with 118 people consisting of only 14 families. Between this range (14 to 267 families), the average number of families per village is only 72. However, the individual family size of the villages shows that the average size of the family in the area is 6.8, which is exceptionally high, with the standard deviations of 1.2. The largest household size is found to be 11.6 members per family in Rajipur, and the smallest one is 5.33 in Harijan Nada. A large household size among the HRMS villages suggests that: (1) the prevalence of some sort of joint family structure in the area and/or (2) the number of children in each family is high.

The age structure of the population also discloses the presence of a significant number of children. The share of children (48%) in the total population of the area projects considerable human pressure on the natural resources in the future.

Sex ratio

The sex ratio in Haryana reflects a very poor situation for women varying between 813 and 931 across the districts, with an average of 865 females per 1000 males. Sex ratios are equally adverse in almost all the HRMS villages. The average sex ratio of the HRMS villages is 824, which is even less than the average sex ratio of the State. Against this backdrop, the village Masoompur stands out as the only exception with an ideal sex ratio of 1032. This male dominant structure of the population reveals that a whole complex of socio-cultural attitudes, beliefs, privileges, and values unfavourable towards women are operating in the family and community life of these villages. The literacy rate of the state at 40.47% for women, as against 69.1% for men, reflects a fairly better average (Figure 1).

Caste structure

Caste is the primary unit of social stratification in India, and represents social rankings. Castes commonly found in HRMS areas are *Banjara, Bhanjadas, Brah-*

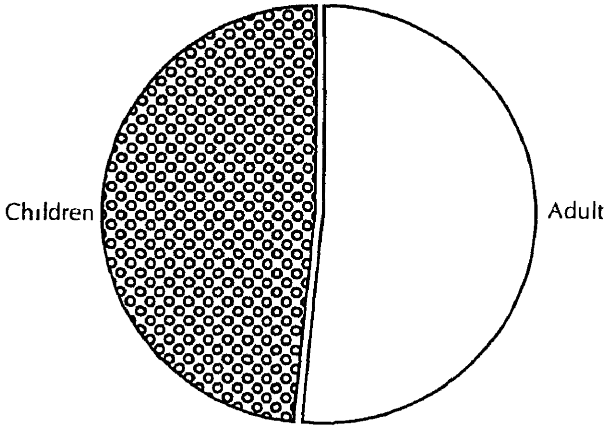


Figure 1. Agewise distribution in the HRMS area

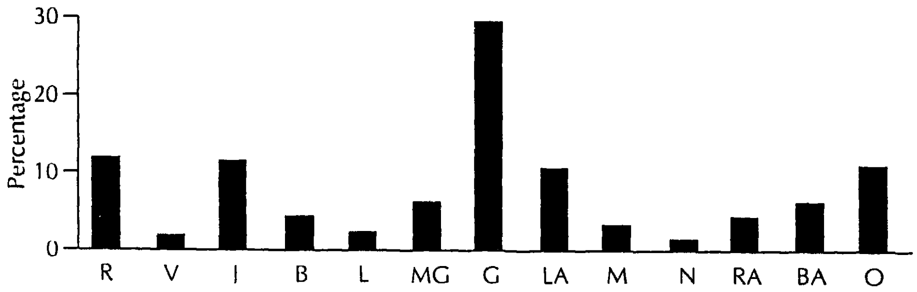
min, Gujjar, Jat, Lohar, Lawane, Nai, Ramdasiya, Rajput, and *Valmiki* (Figure 2). Among these *Banjara, Bhanjadas, Gujjar, Lohar, Nai Ramdasiya,* and *Valmiki* belong to the lower castes. The most dominant caste is *Gujjar* followed by *Jat, Ramdasiya, Banjara,* and others. The number of upper caste population (*Brahmin, Jat, and Rajput*) is insignificant, accounting for approximately 20% of the total families of that area (Appendix II). Most of the villages are heterogeneous in caste composition (composed of 5 to 10 castes). However, villages like Bargodam, Chowki, Kalka, and Rana are mono-caste in composition. Since most of the caste groups present in these villages belong to the lower strata of society, character-wise also there is homogeneity among them.

Occupation

Haryana is predominantly an agricultural state. The consolidation of land-holdings, the extension of irrigation facilities, and the use of improved seeds and fertilizers have helped in bringing a green revolution in the State. 78% of the population is rural and out of the total geographical area of 4.42 million hectares, 82.75% is under cultivation. In comparison, about 48% of the families are engaged in agricultural activities in the JFM villages (Appendix III). Next to agriculture, about 23% are wage labourers while 20% are in services. The salient feature of this data is that very few are dependent on animal husbandry.

Agriculture

As mentioned above, agriculture forms the mainstay of the economy of the area. Villagewise land-holding distributions show that the average land-holding per family varies between six bighas in Kahinwala and Harijan Nada to 48 bighas in



R: *Ramdasiya,* V: *Valmiki,* J: *Jat,* B: *Brahmin,* L: *Lohar,* MG: *Muslim Gujjar,* G: *Gujjar,* LA: *Lawane,* M: *Muslim,* N: *Nai,* RA: *Rajput,* BA: *Banjara* and *Bhanjada,* O: Others

Figure 2. Caste distribution in the HRMS area (family-wise)

Gumthala and Gobindpur. But the figures on maximum and minimum land-holdings of the villages reveal a skewed distribution of land resources.

From 86 earthfill dams constructed in 52 villages by the Forest Department having a total water storage capacity of 633.64 hectare metre (ha m), over 2854 ha of agricultural land is receiving irrigation water. This has increased marginally with better distribution of water from existing dams. While canal irrigation available in a few districts of the state is not present in the JFM area, some of the villages in the programme area do have channel (*kuhl*) irrigation. Tubewell irrigation is also a predominant feature in many villages.

The crops grown in the district can be divided into two main categories namely *kharif* and *rabi*. The former is summer season harvest and the latter is the winter season harvest. The major crops of the area are sugarcane, paddy, wheat, bajra, pulses, maize, cotton, chillies, oilseeds, groundnut, and vegetables.

Animal husbandry

Livestock rearing is the second most important occupation for the people. The Haryana Shivalik foothills are considered as regions where there is moderate livestock pressure, with a large proportion of traditional breeds of livestock. Further, a rather high concentration of goats is also found in the Shivalik area. However, the introduction of JFM and the increased supply of fodder have resulted in a sea-change in the livestock composition of the villages in the Shivalik areas wherein superior breeds of buffaloes form almost 50% of the livestock holding in the project villages.

Livestock scenario of the HRMS villages shows that among the total livestock population; buffaloes are maximum in number—on an average, each family has 2.44 buffaloes (Appendix IV). Altogether there are 3158 (23%) cows, 6014 (44%) buffaloes, 1703 (12%) bullocks, 1260 (9.16%) goats, and 50 (0.36%) camels (Figure 3).

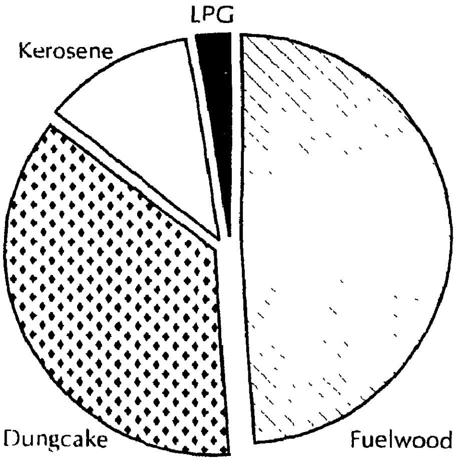


Figure 3. Distribution of livestock in the HRMS area

Buffaloes are reared mainly for dairying, cows and goats for marketing the young ones, and camels for transportation. Green grass is commonly used as fodder. In all, 43% of the total families of the area collect green grass from forest, 33% from agricultural fields, whereas 24% families get the required fodder both from forest and agricultural fields (Appendix V).

Fuel sources

All the villages in the state have metalled roads and they are all electrified. The important sources of energy for use in the domestic sector include: (1) firewood (both solid and twigs); (2) dungcakes; (3) crop residues; (4) kerosene; (5) liquified petroleum gas (LPG); and (6) others (wood charcoal, electricity, coal, etc.). The state-level estimates reveal that 35.8% of the energy requirement of the rural population comes from dungcakes for cooking and 30.2% from firewood. Crop residues account for 30.6%. The National Council of Applied Economic Research (NCAER) assessed that firewood, twigs, dung-cake', and crop residues accounted for 95% of the rural energy requirements in Haryana (NCAER 1986).

The pattern of energy consumption in HRMS areas corroborates the above energy scenario of the state (Figure 4). Appendix VI reveals that firewood is the primary source of fuel for 99.45% of the households of the area. Next to firewood, dungcake accounts for 75.45% households. Thus, there is almost a total dependence on biomass among the villagers. In the case of commercial fuels, kerosine is used by only 24.83% of households whereas barely 4.73% of the households use liquefied petroleum gas (LPG). This energy consumption pattern highlights the ever-increasing pressure on forests for firewood.

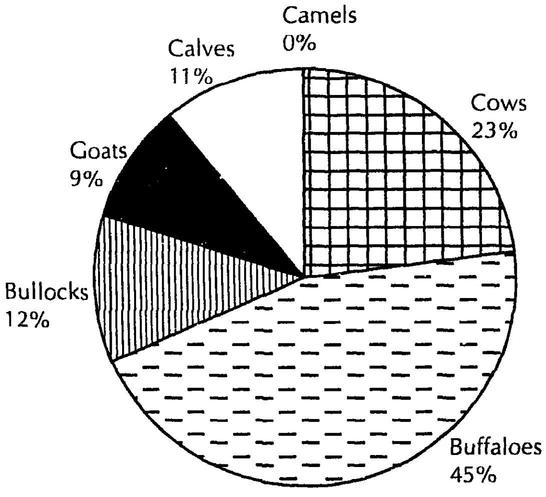


Figure 4. Fuel consumption pattern in the HRMS area

The pattern of LPG use in the HRMS villages shows a distinguishable correlation between family status and the quantum of LPG connections. For an exhaustive analysis, five villages have been selected with the largest number of connections in the HRMS area. It is clear from Table 1 that out of the total 70 connections in the sample villages, 35 connections (50%) belong to the families who are in permanent services. The rest (50% connections) are divided among peasants, wage labourers, and businessmen. Accordingly, 18 connections (25.7%) go to houses of agriculture-based families while 10 (14.3%) are connected with wage labour families. Only seven connections (10%) of the total belong to tradesmen.

Caste-wise break-up of connections also reveals that 33.3% of the connections are owned by the upper caste belonging to *Brahmins, Jats,* and *Rajputs* (Table 2) while their proportion of population in the sample villages is only 20%. On the other hand, *Lawane, Lohar,* and *Ramdasiya,* though lower in caste hierarchy, own 22.9%, 9%, and 5.7% connections, respectively. This is probably because many of the people in these villages are in service and some of them, specially *Lawane,* have good land-holdings too. It can be safely inferred from the data, that families who have some sort of permanence and regularity in their income are the consumers of LPG. The most striking feature is that 14.3% of the LPG connections

Table 1. Occupationwise analysis of LPG consumers

HRMS	S	A	L	WL	T/B
Dhamala	4	1	—	4	1
Jattanmajri	5	3	—	—	2
Nada Vas	6	9	—	1	1
Nanakpur	10	4	—	3	—
Manakpur Nanakchand	10	1	—	2	3
Total	35	18	—	10	7
	(50%)	(25%)	—	(14%)	(10%)

S: Service, A: Agriculture, L: Livestock rearing, WL: Wage labour, T/B: Trade and business.

Table 2. Castewise analysis of LPG consumers

HRMS	Bh	B	G	J	La	L	M	N	R	Rj	S	Ti	T	Total
Dhamala	2	—	—	1	—	3	—	—	4	—	—	—	—	10
Jattanmajri	—	—	—	6	—	—	—	1	—	—	—	—	3	10
Nada Vas	—	1	—	—	15	—	—	—	—	—	1	—	—	17
Nanakpur	2	—	3	—	1	—	1	—	—	8	—	—	2	17
Manakpur Nanakchand	2	—	—	3	—	6	—	—	—	—	—	1	4	16
Total	6	1	3	10	16	9	1	1	4	8	1	1	9	70

Bh: *Brahmin*, B: *Banjara*, G: *Gujjar*, J: *Jat*, La: *Lawane*, L: *Lohar*, M: *Muslim*, N: *Nai*, R: *Ramdasiya*, Rj: *Rajput*, S: *Saini*, Ti: *Timan*, T: *Takhan*.

are owned by wage labour families. It may be because of the continuous availability of work in the area.

Industrialization

Where industrialization is concerned, the two major examples of industries in this area are the Associated Cement Companies (ACC) Limited at Surajpur and the Yamunanagar Paper Mills. While the paper mills are dependant on the forest areas for meeting raw material requirements, especially *bhabbar* from the forest areas; the workers at the ACC factory, who have settled in villages around the factory are dependant on the forests for fodder and fuelwood. However, a number of villagers are employed with the State Government in various capacities in different departments.

Relationship between caste status and distribution of resources

Caste in Haryana, quite akin to the Indian context, has come to serve as a reflection of the socio-economic status of people. A preliminary look at the resource status of families belonging to different castes across the programme area reveals that a few castes perceived as dominant like the *Jats* and *Gujjars* have high land and livestock holdings. Though the *Banjaras, Lohars, Bhanjadas, Ramdasiyas* are more or less resourceless, some of them are involved in forest-based crafts (*Banjaras* and *Bhanjadas*), while the rest are dependant on agriculture and other works, especially as wage labour.

Land-holding patterns

In order to understand this relationship better, four multi-caste villages were selected and the caste-wise land-holding was analysed (Table 3). Across the programme villages of Kheda, Basaula, Masoompur, and Kiritpur, the observation was that *Jats* and *Gujjars* are the highest land-holding castes, and are part of different villages. Their land-holdings range from 1 bigha to about 100 bighas. The other castes have land-holdings below 10 bighas except for *Lawane* and *Valmiki* who are seen to have holdings in the range of 10 to 20 bighas.

Across the four villages, only 3.7% (average) *Jat* families are landless (Table 4). Landlessness is very high among the *Banjaras, Lohars, Ramdasiyas, Pinje,* and *Valmikis*—above 75%. While no landlessness is seen among the *Goswamis* and *Muslims*, this is of little significance considering at the small number of families in the villages. More than 85% of the *Lawanes* are land-holders.

Another important aspect to note in understanding the economic position of the families belonging to different castes is that while the majority of the landless

Table 3. Land-holding pattern in four multi-caste villages

Village	Castewise land-holding				Land-holding (in Bighas)				
	Caste	Total families	Land-less	Land-holder	0–10	10–20	20–35	35–50	Above 50
Kheda	*Jat*	27	—	27	8	9	6	1	3
	Brahmin	3	2	1	1	—	—	—	—
	Ramdasiya	27	25	2	1	—	1	—	—
	Muslim	1	—	1	1	—	—	—	—
	Pinje	5	4	1	1	—	—	—	—
	Lohar	9	8	1	1	—	—	—	—
Kiritpur	*Lohar*	2	2	—	—	—	—	—	—
	Lawane	51	7	44	37	7	—	—	—
	Ramdasiya	2	2	—	—	—	—	—	—
	Banjara	4	3	1	1	—	—	—	—
	Jat	39	4	35	7	8	5	3	12
Masoom-pur	*Gujjar*	44	—	44	3	27	10	—	4
	Ramdasiya	10	4	6	6	—	—	—	—
	Valmiki	2	2	—	—	—	—	—	—
Basaula	*Jat*	22	1	21	4	5	9	1	2
	Brahmin	9	8	1	1	—	—	—	—
	Ramdasiya	53	53	—	—	—	—	—	—
	Valmiki	17	14	3	2	1	—	—	—
	Lohar	10	8	2	2	—	—	—	—
	Goswami	1	—	1	1	—	—	—	—

Jats and *Gujjars* are in service, mostly government, the majority of landless families belonging to the other castes are into wage labour or are employed as agriculture labour. These livelihood opportunities have been seen to define and influence the lifestyles and living standards of these villagers.

Table 4. Castewise analysis of landless (%)

Villages	Ba	L	R	V	J	M	G	La	B	Go	P
Kheda	—	89.0	93.0	—	0.0	0.0	—	—	66.7	—	80.0
Kiritpur	75.0	100.0	100.0	—	10.3	—	—	13.7	—	—	—
Masoompur	—	—	40.0	100.0	—	—	0	—	—	—	—
Basaula	—	80.0	100.0	82.5	4.5	—	—	—	88.9	0	—

L: *Lohar*, R: *Ramdasiya*, V: *Valmiki*, J: *Jat*, B: *Brahmin*, M: *Muslim*, G: *Gujjar*, La: *Lawane*, Ba: *Banjara*, Go: *Goswami*, P: *Pinje*.

Livestock holdings

The livestock holding in the programme villages also has a close linkage with the caste status of families. In order to understand which sections of the society are more dependent on livestock for livelihood and how the type of livelihood varies with castes were also studied. What is important to note is the relationship discussed below, between land-holding and the owning of livestock that is stall-fed, and requires the growing and collection of fodder from and near farm lands. Table 5 provides the scenario of five multi-caste villages from the project area.

Table 5. Livestock holding of five programme villages

HRMS	Caste	Livestock					
		Buffaloes	Cows	Bullocks	Goats	Camels	Calves
Mirpur	*Gujjar*	139	127	84	13	2	74
	Ramdasiya	2	2	0	0	0	1
Masoompur	*Gujjar*	115	234	67	31	1	0
	Valmiki	1	0	0	2	0	0
	Ramdasiya	5	0	4	0	0	0
Kona	*Brahmin*	0	0	1	0	0	0
	Jat	0	2	0	0	0	0
	Valmiki	0	11	0	0	0	2
	Banjara	0	1	0	0	0	1
	Gujjar	37	138	4	0	0	31
	Julahe	0	6	0	0	0	1
	Kabirpanthi	14	12	4	0	0	14
	Lawane	6	54	0	0	0	7
	Nai	0	2	1	3	0	0
	Ramdasiya	2	11	0	0	0	5
	Takhan	0	3	0	0	0	0
Kheda	*Brahmin*	7	0	0	0	0	2
	Jat	65	0	4	0	0	47
	Lohar	11	0	2	0	0	3
	Pinje	3	1	0	0	0	1
	Ramdasiya	33	3	4	0	0	5
	Takhan	1	0	0	0	0	0
	Timan	1	0	0	0	0	0
Dhamala	*Brahmin*	23	0	0	0	0	4
	Jat	170	2	31	11	0	47
	Jhinwar	2	1	0	0	0	3
	Kahar	6	0	0	0	0	2
	Lohar	5	0	0	0	0	1
	Ramdasiya	6	0	0	0	0	2
	Valmiki	5	3	0	0	8	2
	Muslim	5	0	0	0	1	3
	Total	664 (36.6%)	613 (33.8%)	206 (11.4%)	60 (3.3%)	12 (0.7%)	258 (14.2%)

As many as 17 castes are found in the five villages being discussed. The livestock holdings are seen to relate to the occupations of the castes. The area is recognized for its high goat and cattle population with cows making up nearly 34% of the livestock population. While the feeding patterns differ for the cattle which include migrations at different points of the year, the phenomenon in the case of goats is a reflection of the success of the JFMP. Goats contribute only 3.3% of the total livestock population and a substantial number of these belong to the *Gujjar* families and are essentially reared for religious purposes. Otherwise most of the goat population in the programme villages have been sold and no grazing is allowed in the protected forest areas.

Buffaloes are all stall-fed and contribute to nearly 37% of the livestock population. Calves are an important source of income for the villagers. Calves are sold in the hilly areas for draft power in agricultural operations.

In order to understand the intricate linkage between caste and occupation, the livestock holdings of different castes were taken up to understand their dependence on animal husbandry. *Gujjars,* who possess more than 60% of the total livestock population in the five villages (Table 6) inhabit only three of the five villages (Table 5). They possess 81.4% of the cows, 43.8% of the buffaloes, 75.2% of the bullocks, 77.3% of the goats and 40.7% of the calves. The *Jats* with nearly 40% of the total buffalo population possess about 20.9% of the total livestock. The next large holding of 3.7% of the total is with the *Lawane* who are found only in one village. All the other castes possess less than 15% of the total livestock population. All this reflects the large-scale dependence of the other castes who are

Table 6. Castewise holding of livestock

Castes	Livestock						
	Cows	Buffaloes	Bullocks	Goats	Camel	Calves	Total
Gujjar	499	291	155	44	3	105	1097
Ramdasiya	16	48	8	—	—	13	85
Valmiki	14	6	—	2	8	4	34
Brahmin	—	30	1	—	—	6	37
Jat	4	235	35	11	—	94	379
Banjara	1	—	—	—	—	1	2
Julahe	6	—	—	—	—	1	7
Kabirpanthi	12	14	4	—	—	14	44
Lawane	54	6	—	—	—	7	67
Nai	2	—	1	3	—	—	6
Takhan	3	1	—	—	—	—	4
Lohar	—	16	2	—	—	4	22
Pinje	1	3	—	—	—	1	5
Timan	—	1	—	—	—	—	1
Jhinwar	1	2	—	—	—	3	6
Kahar	—	6	—	—	—	2	8
Muslim	—	5	—	—	1	3	9
Total	613	664	206	60	12	258	1813

economically marginalized (largely dependant) on labour—both agricultural and wage, and service for earning their livelihood. The lifestyles of these families are a confirmation of their poor resource holdings and limited economic avenues.

Dependence on forests

The dependence of people of Haryana for biomass on forests is limited to the Shivaliks, owing to the concentration of forests in this area. In rest of the State and in the Shivalik region as well, fodder and fuelwood are derived from and around agricultural fields. In order to quantify the dependence of villagers in the project area on forests, two specific instances of fodder and fuelwood dependence were considered for select villages.

Fodder requirements

Forest along with agricultural land is an important source of fodder. Of the 38 HRMSs in Morni-Pinjore Division, except for Kalka where bamboo is the main incentive and livestock population is negligible, all are dependant on green fodder. While nearly eight percent of the families graze their animals in the forests, the rest harvest fodder from agricultural and forest land in the ratio 1:0.8 in favour of agricultural land. While 19 villages derive fodder free of cost owing to the concessions granted to them during the settlements, 17 HRMS pay for the fodder and the *dati* (fee charged per family for harvesting one head-load of fodder grass/day/season) rates range from as low as Rs 35 at Khudabaksh to as high as Rs 496 at Kona with the average for the HRMS being Rs 243.

A more detailed study of fodder requirements was undertaken for nine villages where a quantification exercise for green and dry fodder used, and the costs involved were studied. While looking at the sources for fodder, the study revealed that in three villages the dependence is greater on the agriculture land (Table 7).

Table 7. Number of families and fodder sources

HRMS	Total number of families	Fodder from forests	Fodder from agriculture
Basuala	112	27	43
Kheda	75	44	32
Nada Vas	131	125	103
Moginand	59	50	51
Thattar	55	48	19
Gobindpur	42	41	41
Nanakpur	267	110	119
Raina	166	60	147
Mauliwala	78	75	76

While three villages show an equal dependence of households on both forest and agriculture land, the remaining three villages show a greater dependence on forests. There is very little correlation of the sources with the type of livestock, but the source has a positive correlation with the agricultural land-holding of the respective villages. Villages with large agricultural land-holdings are seen to grow fodder in the off-seasons to supplement available stocks.

Comparing the figures of *tudi* (dry fodder) procurement with the quantum of fodder derived from the forest areas for the nine villages under study reveals an interesting interaction between forests and agriculture (Table 8). The combined requirement of the nine villages, namely Basaula, Kheda, Nada Vas, Moginand, Thattar, Gobindpur, Nanakpur, Raina, and Mauliwala, with a total of 991 families for fodder, both green and dry was estimated (Table 8). The total fodder requirement is met from different sources other than the fodder grasses harvested from the forest area. Among the other sources are *Mongri* (juvenile *bhabbar*) which is harvested when the *bhabbar* grass after its previous harvest starts regenerating with the rains. This is essentially for two-to-three months in a year. While only three percent of the families are dependant on this, of the total *tudi* required by the families in the villages, the sourcing is either from the market within Haryana or Punjab, and from individual agricultural fields.

Of the *tudi* required, 88% of the families procure it from the market, while 85% derive it from agriculture in the form of crop residues. The average fodder requirement per family is different across the villages which shows a vast variation from a low of 20 quintals (Kheda) to a high of 107 quintals (Raina). The consumption of fodder is related to livestock holding which is caste-based and this is reflected in the range of maximum and minimum consumption levels.

The maximum consumption levels for individual villages are found among the *Gujjars,'Lawane,* and *Jats* who are seen to have maximum livestock holdings and correspondingly the largest fodder requirement. The maximum *tudi* consumption in any village ranges between 6 quintals (*Gujjar* family) and 0.6 quintals where the *Jats* are dominant. The minimum has a range from 0.4 to 0.15 quintals across villages.

Tudi requirement from the market ranges over one month in Raina to all the twelve months in Moginand, Thattar and Gobindpur. The price at which *tudi* is procured from the market also varies. While the average prices range between Rs 110 and Rs 158 for a quintal of *tudi* in the local market, the maximum ranges between Rs 135 and 180 and the minimum amount paid in different villages between Rs 75 and 120. The reasons for the variation could be the season of procurement, the distance from market, and the related transportation cost.

Fuel requirements

A look at the HRMS reveals that the major fuel sources are firewood, dungcake, kerosene, and LPG. Since all the villages in Haryana are electrified, the various fuels are used mostly for cooking. In the winter, three-to-five per cent of the villages

Table 8. Fodder requirements of select villages and sources

HRMS	Number of families						Quantity		Months	Price		
	TF	MH	*Tudi*	FM	FA	Average	Maximum	Minimum		Average	Maximum	Minimum
Basaula	112	N	63	45	28	22	80 (*Jat*)	4	5.5	Rs 148	Rs 150	Rs 100
Kheda	81	6	55	55	28	20	60 (*Jat*)	5	5.8	Rs 328	Rs 180	Rs 110
Nada Vas	131	N	125	94	116	33	80 (*Labane*)	5	6	Rs 120	Rs 160	Rs 100
Moginand	59	N	56	56	48	31	80 (*Gujjar*)	5	12	Rs 115	Rs 150	Rs 100
Thattar	55	N	47	45	47	72	400 (*Gujjar*)	2	12	Rs 110	Rs 150	Rs 100
Gobindpur	42	N	41	41	41	85	400 (*Gujjar*)	15	12	Rs 111	Rs 150	Rs 100
Nanakpur	267	23	222	195	189	36	100 (*Gujjar*)	5	6	Rs 129	Rs 150	Rs 120
Raina	166	N	150	143	141	107	600 (*Gujjar*)	5	1	Rs 110	Rs 175	Rs 75
Mauliwala	78	N	74	64	74	85	300 (*Gujjar*)	10	12	Rs 108	Rs 135	Rs 100
Total	991	29 3%	833 84%	738 88%	712 85%							

Note. TF: Total families; MH: Mongri harvested; FM: From the market; FA: From agriculture fields.

use dungcakes for heating. While almost the entire population uses firewood, nearly 75% uses dungcake, which is, of course, related to the livestock holdings of families. Less than 25% of the families use kerosene in villages which can access the government depots in the towns and less than 5% uses LPG. This leaves out all the villages located in interior areas. The use of LPG and kerosene reflects the occupational status of families. Those families, who have members in service, government or private, are more inclined to use of kerosene and LPG.

While villages which have large livestock populations use dungcakes, villages like Bargodam and Kalka which have negligible or no livestock holdings depend on forest only for firewood. The total livestock population in a village and its forest dependency are not positively correlated, in that, even in villages where large number of cattle heads are found, the dependence on forest is not correspondingly lower. This could be due to the rather skewed nature of holdings in villages and all the marginalized sections, who are resourceless, are dependant on forests. Also while fuelwood extraction from forests is free, dung has a lucrative alternative use as manure in agricultural fields. The fact that a large proportion of the livestock is buffaloes, which are stall-fed, the collection and use of dung in fields is not difficult.

Significance of socio-economics in forest protection

An analysis of the socio-economic and demographic composition of the HRMS villages reveals that these figures and trends have important consequences for forest protection activities. Some of the positive features for forest protection that emanate from the existing socio-economic structure of the villages have been delineated below.

- The villages as mentioned before are small and cohesive. This cohesiveness observed in small villages is an encouraging factor for the successful implementation of micro-level planning. The easy identification of incentives required and the ability to arrive at equitable distribution of benefits has helped in bringing about cognizable changes.
- A total or near homogenous caste composition of the villages ensures greater access to all families owing to an almost similar socio-economic status.
- Both the landed and the landless of these villages are equally dependent on the forests for the extraction of fuelwood and fodder. While the landed also derive these products from their agricultural fields, since their requirements are significantly higher then the landless who have limited livestock, there is an equivalent dependence of both these sections on the forests, resulting in their having an equal stake in their protection.

APPENDIX I

Demographic profile of the HRMS villages

Serial no.	HRMS	Total families	Total population	Adult	Children	Average family size	Sex ratio
1	Basaulan	112	359	189	170	6.7	850
2	Bargodam	37	202	92	110	5.5	804
3	Bharal, Mandwa	58	377	203	174	6.5	857
4	Bharauli	76	433	225	208	5.7	782
5	Chowki	35	214	99	115	6.0	911
6	Damdama	62	360	176	184	5.9	911
7	Dhamala	116	843	457	386	7.2	873
8	Dulopur	14	118	53	65	8.4	815
9	Gobindpur	42	310	143	167	7.2	694
10	Gumthala	20	119	58	61	5.8	750
11	Harijan Nada	24	128	75	53	5.3	707
12	Jattanmajri	67	603	346	257	9.0	811
13	Kahinwala	51	323	160	163	6.3	846
14	Kalka	20	128	52	76	6.4	939
15	Kekra Thapal	40	232	121	111	5.8	719
16	Kheda	75	527	278	249	6.5	786
17	Khudabaksh	50	278	120	158	5.6	878
18	Kiratpur	100	751	393	358	7.5	823
19	Kona	128	817	396	421	6.4	816
20	Lohgarh	76	568	274	294	7.3	821
21	Manakpur Nanakchand	94	674	358	316	7.2	774
22	Manakpur Thakurdas	29	215	106	109	7.4	777
23	Masoompur	58	380	202	178	6.6	1032
24	Mauliwala	78	565	279	286	7.2	766
25	Mirpur	57	356	179	177	6.3	771
26	Moginand	59	367	186	181	6.2	892
27	Nada Vas	131	823	389	434	6.3	837
28	Nanakpur	267	1757	1015	742	6.6	871
29	Prempura	49	312	137	175	6.4	857
30	Raina	166	965	478	487	5.8	828
31	Rajipur	24	278	141	137	11.6	972
32	Rampur	65	507	271	236	7.8	760
33	Rana	19	104	51	53	5.5	857
34	Sukhomajri	91	621	336	285	6.8	749
35	Surajpur	166	1430	759	671	8.6	912
36	Thadion	43	315	159	156	7.3	790
37	Thathar	55	312	162	150	5.7	733
38	Trilokpur	72	513	266	247	7.1	763
	Total	2726	18184	9384	8800	—	—

APPENDIX II

Caste composition of the HRMS villages

Serial no.	HRMS	Castes commonly found in the area												
		R	V	J	B	L	MG	G	L	M	N	R	Bh	O
1	Bargodam	—	—	—	—	—	—	—	—	—	—	—	37	—
2	Basaula	53	17	22	9	10	—	—	—	—	—	—	—	1
3	Bharal	—	—	—	49	—	—	—	—	—	—	8	—	1
4	Bharauli	24	—	—	—	—	—	34	—	—	—	12	—	6
5	Chowki	—	—	—	—	—	—	—	—	—	—	—	35	—
6	Damdama	4	—	—	—	—	—	38	—	—	—	—	—	20
7	Dhamala	22	21	37	7	14	—	—	—	5	—	—	—	10
8	Dulopur	—	—	—	—	—	—	—	—	—	—	14	—	—
9	Gobindpur	—	—	—	—	—	—	42	—	—	—	—	—	—
10	Gumthala	8	—	—	—	—	—	12	—	—	—	—	—	—
11	Harijan Nada	23	—	—	1	—	—	—	—	—	—	—	—	—
12	Jattanmajri	11	—	46	—	1	—	—	—	—	6	—	—	3
13	Kahinwala	—	—	—	—	—	—	—	22	—	—	—	29	—
14	Kalka	—	—	—	—	—	—	—	—	—	—	—	20	—
15	Kheda	27	—	27	3	9	—	—	—	1	—	—	—	8
16	Khokra	12	—	2	—	—	—	17	—	—	—	3	—	6
17	Khudabux	—	—	—	—	1	—	—	—	49	—	—	—	—
18	Kiritpur	2	—	39	—	2	—	—	53	—	—	—	4	—
19	Kona	10	6	1	2	—	—	46	26	—	3	—	3	31
20	Lohgarh	9	—	55	—	—	—	—	—	—	—	—	—	12
21	Manakpur Nanakchand	21	—	42	2	11	—	—	—	—	6	—	—	12
22	Manakpur Thakurdas	—	—	27	2	—	—	—	—	—	—	—	—	—
23	Masoompur	10	2	—	—	—	—	44	—	—	—	—	—	2
24	Mauliwala	—	—	—	—	—	—	65	—	—	—	—	—	13
25	Mirpur	2	—	—	—	—	—	55	—	—	—	—	—	—
26	Moginand	6	—	—	—	—	—	51	—	—	—	—	—	2
27	Nada Vas	—	—	—	—	—	—	—	126	—	1	—	—	4
28	Nanakpur	13	—	—	6	—	—	115	28	10	—	52	—	43
29	Prempura	3	—	—	—	—	—	—	27	—	—	—	19	—

(Continued)

APPENDIX II (*Continued*)

Serial no.	HRMS	Castes commonly found in the area												
		R	V	J	B	L	MG	G	L	M	N	R	Bh	O
30	Raina	11	—	—	—	—	155	—	—	—	—	—	—	—
31	Rajipur	—	—	—	—	—	—	24	—	—	—	—	—	—
32	Rampur	—	—	—	—	—	—	65	—	—	—	—	—	—
33	Rana	—	—	—	—	—	—	19	—	—	—	—	—	—
34	Sukhomajri	—	—	3	—	—	—	88	—	—	—	—	—	—
35	Surajpur	33	—	8	32	7	—	—	3	—	—	14	16	53
36	Thadion	—	—	—	—	—	—	37	—	—	—	—	—	6
37	Thathar	14	—	—	—	—	—	41	—	—	—	—	—	—
38	Trilokpur	4	3	—	—	—	—	—	—	11	8	—	—	46
	Total	322	49	309	113	55	155	793	285	76	24	103	163	279
			11.81*	1.80*	11.34*	4.15*	2.02*	5.69*	29.09*	10.45*	2.79*	0.88*	3.78*	5.98*

*percentage of the families belonging to the particular caste.

Note. R: *Ramdasiya*, V: *Valmiki*, J: *Jat*, B: *Brahmin*, L: *Lohar*, MG: *Muslim Gujjar*, G: *Gujjar*, L: *Lawane*, M: *Muslim*, N: *Nai*, R: *Rajput*, Bh: *Banjara* and *Bhanjada*, and O: Others.

Figures in the table represent the number of families.

APPENDIX III

Occupational structure of the HRMS villages

Serial no.	HRMS	Service	Agriculture	Animal husbandry	Wage labour	Trade/ Business
1	Bargodam	—	—	—	—	37
2	Basaula	—	21	5	55	13
3	Bharal, Mandna	5	53	—	1	—
4	Bharauli	1	45	1	29	—
5	Chowki	13	18	—	4	—
6	Damdama	14	26	—	20	16
7	Dhamala	31	26	2	56	7
8	Dulopur	1	13	—	1	—
9	Gobindpur and Mandapa	4	36	42	—	—
10	Gumthala	1	7	—	11	1
11	Harijan Nada	10	1	—	12	1
12	Jattanmajri	15	24	4	21	7
13	Kahinwala	—	26	—	28	—
14	Kalka	1	—	—	—	18
15	Kheda	28	14	2	47	5
16	Kholra Thappal	9	16	—	15	—
17	Khudabaksh	—	34	1	17	1
18	Kiritpur	35	49	—	15	2
19	Kona	40	38	—	42	6
20	Lohgarh	25	30	1	20	—
21	Manakpur Nanakchand	35	22	—	27	6
22	Manakpur Thakurdas	5	22	—	2	—
23	Masoompur	6	47	—	5	—
24	Mauliwala	5	73	—	—	1
25	Mirpur	3	52	1	1	—
26	Moginand	16	39	—	8	—
27	Nada Vas	15	87	—	30	9
28	Nanakpur	80	114	2	71	2
29	Prempura	5	20	—	24	0
30	Raina	4	110	12	33	9
31	Rajipur	8	9	—	7	—
32	Rampur	3	64	22	—	—
33	Rana	1	18	—	—	—
34	Sukhomajri	51	28	1	10	—
35	Surajpur	60	16	7	53	12
36	Thadion	2	41	—	—	—
37	Thathar	3	52	11	—	
38	Trilokpur	8	32	—	21	3
	Total	543 (20.2)	1302 (48)	109 (4)	631 (23)	106 (4)

Note. Figures in the table represent the number of families. However some families are engaged in more than one occupation.
Figures in parenthesis indicate the percentage of families engaged in that particular occupation.

APPENDIX IV

Livestock population of the HRMSs

Serial no.	HRMS	Cows	Baffaloes	Bullocks	Goats	Camel	Calves	Total
1	Bargodam	1	8	2	3	—	1	15
2	Basaula	21	113	22	—	—	47	203
3	Bharal	80	64	76	19	—	11	250
4	Bharauli	35	228	61	46	—	6	376
5	Chowki	48	41	36	23	—	28	176
6	Damdama	11	106	29	31	—	33	210
7	Dhamala	7	222	31	19	1	61	341
8	Dulopur	24	25	21	—	1	—	71
9	Gobindpur	70	284	54	81	4	77	570
10	Gumthala	10	39	—	22	—	12	83
11	Harijan Nada	5	7	7	10	—	2	31
12	Jattanmajri	9	211	34	1	—	68	323
13	Kahinwala	18	69	45	67	4	19	222
14	Kalka	—	—	—	—	—	—	—
15	Kheda	4	121	10	—	—	60	195
16	Khokra Thapal	9	73	20	—	—	40	142
17	Khudabaksh	27	101	43	186	2	47	406
18	Kiritpur	20	295	24	—	2	64	405
19	Kona	16	240	59	10	—	63	388
20	Lohgarh	10	207	36	—	—	72	325
21	Manakpur Nanakchand	54	111	22	1	—	53	241
22	Manakpur Thakurdas	9	110	19	—	—	53	191
23	Masoompur	235	122	73	33	1	—	464
24	Mauliwala	262	283	120	134	11	—	810
25	Mirpur	129	141	84	13	2	75	444
26	Moginand	48	107	23	246	1	62	487
27	Nada Vas	32	257	95	2	2	83	471
28	Nanakpur	17	420	155	28	1	146	767
29	Prempura	42	65	27	27	2	5	168
30	Raina	1382	333	123	43	8	142	2031
31	Rajipur	4	77	14	—	—	26	121
32	Rampur	124	488	109	4	—	12	737
33	Rana	18	88	19	5	—	23	153
34	Sukhomajri	10	275	50	36	—	54	425
35	Surajpur	56	241	21	25	—	94	437
36	Thadion	72	224	44	1	2	5	348
37	Thattar	218	157	64	123	6	29	597
38	Trilokpur	21	61	31	21	—	—	134
	Total	3158	6014	1703	1260	50	1573	13758

APPENDIX V

Information about fodder

Serial no.	HRMS	Grazing in forests	Green fodder	Fodder from forest	Fodder from Agricultural land	*Dati**	Average *dati* rate
1	Bargodam	1	Y	5	5	—	—
2	Basaula	16	Y	27	43	25	475
3	Bharal	—	Y	50	52	—	—
4	Bharauli	—	Y	42	52	—	—
5	Chowki	34	Y	35	35	—	—
6	Damdama	—	Y	54	52	—	—
7	Dhamala	—	Y	40	35	24	160
8	Dulopur	6	Y	12	12	—	—
9	Gobindpur	9	Y	41	41	—	—
10	Gumthala	2	Y	15	15	—	—
11	Harijan Nada	—	Y	14	14	—	—
12	Jattanmajri	2	Y	43	27	33	213
13.	Kahinwala	—	Y	50	6	50	301
14	Kalka	—	—	—	—	—	—
15	Kheda	—	Y	44	32	33	295
16	Khokra Thapal	—	Y	37	1	—	—
17	Khudabaksh	11	Y	36	13	35	35
18	Kiritpur	—	Y	54	38	55	205
19	Kona	—	Y	83	27	84	497
20	Lohgarh	—	Y	57	21	42	173
21	Manakpur Nanakchand	Y	38	13	38	197	
22	Manakpur Thakurdas	Y	20	5	20	200	
23	Masoompur	6	Y	20	50	—	—
24	Mauliwala	—	Y	75	76	—	—
25	Mirpur	17	Y	54	54	—	—
26	Moginand	20	Y	50	51	—	—
27	Nada Vas	—	Y	125	103	30	—
28	Nanakpur	2	Y	110	119	110	257
29	Prempura	—	Y	45	2	45	300
30	Raina	4	Y	60	147	—	—
31	Rajipur	—	Y	24	—	24	110
32	Rampur	10	Y	50	65	—	—
33	Rana	3	Y	17	17	—	—
34	Sukhomajri	—	Y	55	21	63	220
35	Surajpur	11	Y	73	61	72	250
36	Thadion	16	Y	40	41	—	—
37	Thattar	46	Y	48	19	—	—
38	Trilokpur	3	Y	51	40	—	—
	Total	219	37	1694	1405	783	

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*average *dati* rate in HRMSs = Rs 243; maximum rate found in Kona = Rs 497; minimum rate found in Khudabaksh = Rs 35; the total number of villages keeping *Dati* is 17; figures in columns 3-7 represent the number of families.

APPENDIX VI

Fuel sources in the HRMS area

Serial no.	HRMS	Firewood	Dungcake	Kerosene	LPG
1	Bargodam	37		23	
2	Basaula	108	79	67	5
3	Bharal	58	—	3	—
4	Bharauli	76	64	3	—
5	Chaoki	35	—	4	—
6	Damdama	62	60	14	2
7	Dhamala	113	57	68	10
8	Dulopur	14	12	2	—
9	Gobindpur	42	42	10	2
10	Gumthala	20	15	2	2
11	Harijan Nada	24	2	8	7
12	Jattanmajri	66	61	17	10
13	Kahimwala	51	2	—	—
14	Kalka	20	—	20	
15	Kheda	81	81	40	7
16	Khokra Thappal	40	35	10	—
17	Khudabaksh	50	46	3	
18	Kiritpur	100	95	15	3
19	Kona	128	117	32	3
20	Lohgarh	73	71	27	2
21	Maginand	56	57	3	—
22	Manakpur Nanakchand	94	65	51	16
23	Manekpur Thakurdas	29	26	2	2
24	Masoompur	57	48	1	—
25	Mauliwala	78	65	2	—
26	Mirpur	57	55	7	1
27	Nada Vas 1	131	121	13	17
28	Nanakpur	266	228	99	17
29	Prempura	49	—	5	—
30	Raina	165	150	5	—
31	Rajipur	24	24	12	6
32	Rampur	65	65	4	2
33	Rana	19	17	2	—
34	Sukhomajri	89	87	31	5
35	Surajpur	165	116	58	11
36	Thadion	43	43	1	1
37	Thathar	55	2	—	—
38	Trilokpur	71	48	13	—
	Total	2711 (99.45%)	2056 (75.42%)	677 (24.83%)	131 (4.73%)

Note. Figures in the table represent the number of families.

Programme Implementation Strategies

The 1 June 1990 circular of the Government of India on the *involvement of village communities and voluntary agencies in the regeneration of degraded forest lands* reiterated the need for working out the modalities for eliciting participation of village communities in the development and protection of forests. It recommended that voluntary agencies (VAs) and non-governmental organizations (NGOs) may be suitable for motivating and organizing village communities to protect, develop, and afforest degraded forest lands, especially those in the vicinity of habitation. Specifying the manner in which the NGO/VA could act as an interface between the State Forest Department (SFD) and the local village communities, the circular suggested that programmes for restoration of degraded forests may be taken up on a tripartite arrangement between these parties. Following some attempts through the 1980s, the Haryana Forest Department (HFD) sought support from resource persons based outside the department to develop the programme on a sound basis. The result was the Tata Energy Research Institute's (TERI) collaboration with the HFD starting July 1990, providing the much needed back-up to the HFD for carrying out the programme activities.

The system for implementing the Joint Forest Management Programme (JFMP), as it came to exist eventually, evolved over a course of almost seven years. It was in 1989 that the Working Group (WG), a body for decision-making and the implementation of the programme on joint management of forest areas, was conceived with representatives from the HFD, Ford Foundation (FF), and their consultants. The WG was to meet every month to review the progress of the programme and for planning future activities. Following this, an operational team (OT) was constituted to include HFD staff and external resource persons. The OT was set up to work with local staff, in five villages of the Pinjore range, to develop community management planning methods, formulate production-sharing arrangements for a variety of situations prevalent in the Pinjore range and prepare a policy proposal for the joint management of forest areas by the HFD and the village communities. The policy proposal would have also specified the basis for production sharing with the village communities. Later, in April 1990, the Hill Resource Management Society (HRMS) Support Unit [later called the Joint Management Unit (JMU)] was established with the HFD staff on deputation, to operationalize the programme. In May 1990, the WG was reconstituted to accommodate a representative from TERI.

Institutionalization of Joint Forest Management: the role of TERI

The institutionalization of Joint Forest Management (JFM) can be ensured through a proper integration of such a programme in the very mandate of the Forest Department (FD) and appropriate means of interaction with the village communities. The new approach of management had various social, ecological, legal, economic, and institutional implications. While the SFDs were adopting and operationalizing this approach, there existed a need for a centrally-based research and policy group that could work with the concerned departments. TERI's involvement emanated from a request by the HFD to the Ford Foundation in 1989 to make available the services of suitable resource persons who could assist the HFD in developing the joint management programme on a sound basis (this was simultaneous to the HFD's attempts at rejuvenating the programme in 1989 assisted by the consultants from the FF).

It was important to carry the programme beyond simply a 'dam and lease programme' as it had become in the 1980s. The HFD had constructed 54 dams in 39 communities during 1983–88 at the rate of almost nine per year and by 1988, the HFD had reached a stage, where it was constructing dams at the rate of 15 sites per year (Dhar, Undated). However, the department was in no position to ensure either their proper maintenance or appropriate procedures for use and distribution of dam water resource. Dams were constructed primarily because suitable sites were readily available and, often, leases were offered to the communities without ensuring a prior commitment from the communities towards development and protection of the forest resources. Proper growth and expansion of the programme suffered owing to the poor attention it received from the territorial staff. The FD functionaries had neither the orientation nor the training for undertaking a programme of this type. The resources to support the effort of the field staff were also lacking. Thus, a programme to strengthen the capacity of the FD to work with the village communities became imperative and help from a resource group based outside the HFD was sought.

Specifically, the assistance sought from TERI was for:

- planning the overall strategy and modalities to carry the joint management programme ahead;
- motivating the village communities to undertake watershed management and building up the capabilities of the HRMS members to run the society on their own;
- developing and conducting training programmes for the HFD field staff and officers to orient them to the HRMS programme and building their skills to implement it;
- developing appropriate field methods and procedures for the field staff for interacting with the HRMS and drawing up joint management agreement (JMA) with them;
- addressing gender issues;
- identification of unresolved issues and addressing them through the WG;
- drafting the rules, notification, and procedures necessary for strengthening the joint management programme; and

- documenting programme issues and developing and undertaking information dissemination.

One of the earliest mentions of TERI's involvement in the programme was in the meeting of 11 April 1990, when the FF representative apprised the WG members of a proposed grant of FF to TERI for supporting the department through a programme based outside the HFD. The FF was also contemplating a two-year (1990–92) grant proposal of the HFD, submitted through the state government in December 1989, for financial support to undertake the programme. This grant was to be used by the HFD to set up a separate and formal unit (with formal and not temporarily assigned staff, as was the case). This unit would provide back-up support to the divisional field office which is ultimately responsible for carrying out the programme. Both the grants were approved by the FF by July 1990. While TERI accepted the grant, that for the HFD was subject to discussion. Eventually, in February 1991, in a meeting between the HFD and FF, it was decided to withdraw the grant on the belief that it would help the HFD to internalize the programme.

Thus, TERI became involved formally from 1 July 1990 when it took up a programme on 'National Joint Forest Management Support Centre—Haryana'. A proposal to this effect was submitted by TERI to the FF in April 1990 to fulfil the need of a facilitating agency. Briefly, the proposal envisaged facilitating the development of participatory forest management systems by the various FDs in the country in general, and Haryana in particular. The proposal was approved for funding for a three-year period by the FF in August to be operationally effective from July. The Joint Forest Management (JFM) Support Programme envisages people's participation in the management of forest resources of the state jointly with the HFD. TERI provided all the necessary back-up support to the HFD in developing and implementing the programme. July 1990, thus, signified the beginning of the institutionalization of the Joint Management of Forest Areas Programme of the HFD.

Objectives of the JFMP

The primary objective of the programme was to integrate JFM systematically within the policies, programmes, procedures, and operations of the HFD and at the same time motivate the local communities to protect and manage these forests on a sustainable basis for their own benefit and that of the country at large. The other objectives of the programme are given below.

- To facilitate the development of participatory forest management systems for adoption by the HFD.
- To orient the forestry staff and local communities to bring in attitudinal changes regarding JFMP through regular meetings, workshops, training, and extension activities.
- To provide institutional training and procedure development related consultation services to the HFD.

- To assist in research on the institutional, economic, social, and ecological aspects of a variety of JFM systems being developed by HFD.
- To disseminate information concerning the effects of JFM on ecological regeneration, economic productivity, and environmental security through publications and workshops.
- To promote the exchange of experiences between the HFD staff and other departments/non-governmental organizations through study visits.

The programme became operational in the Morni-Pinjore Forest Division of Haryana in the first phase from 1990 to 1993. Encouraged by the success of the JFM Support Programme and for further intensifying and consolidating the work done in the first phase, the Programme was extended in the second phase (July 1993 to June 1996) in both, the Morni-Pinjore and Yamunanagar forest divisions. The second phase proposed expansion through:

- identifying and strengthening positive factors for smooth implementation of the programme;
- striving for total commitment for the programme from the HFD as a primary requirement;
- extending the programme to Ambala (later called Yamunanagar) forest division;
- imparting JFM orientation training to all officers and staff of the HFD;
- emphasizing training to village communities on awareness about JFM, procedures, rules, etc. of JFM, and introducing JFM through farmers' training camps conducted by the HFD;
- institutional strengthening by more interaction of the HFD, village communities, and the support team;
- regular documentation and analysis, undertaking more research case studies and developing a database;
- focus on gender issues;
- preparing and distributing information dissemination material; and
- publishing a document on JFM.

Programme facilitation and implementation

The JMU and WG, which had evolved gradually in 1989/90 continued to serve as the basic framework of the implementation system of JFMP. The crucial difference lay in the facilitating role of the TERI Resource (Support) Team to the working of the JMU and WG.

Working group

As mentioned earlier, a WG was established in 1989 as a nodal decision-making and coordinating body. One of the foremost decisions of this WG was to call for formulation of a policy proposal on joint management of forest areas for the supporting the JMA. The WG was relatively informal: a lot of people attended the WG meetings, including external researchers who came for brief periods to assist in programme development by undertaking specific studies, exercises, etc. The agenda, and at times a background note, for the WG meetings was prepared and circulated to the members in advance, and the minutes were documented in detail and later circulated. In 1990, when TERI entered the picture, the WG was formally reconstituted by an order of the Principal Chief Conservator of Forests (PCCF), dated 11 May 1990, based on the recommendations of the WG meeting of April 1990. Under the chairmanship of the PCCF, the members of the WG included the Conservator of Forests (CFs) in charge of North Circle, Development, Headquarters; and the divisional forest officers (DFOs) of Morni-Pinjore/Ambala (later Yamunanagar); JMU Coordinator; FF representative; and a TERI representative.

Through the formative years and later, the WG has played a crucial role in deciding several aspects of the programme, ranging from administrative set-up and procedures to the activities envisaged under joint management and issues inherent in it. As the apex decision-making body for the programme, it is the WG which makes recommendations to the state government regarding JFM. As a steering body, the WG has helped decide the direction of the programme through proper planning and ongoing monitoring. Since the very beginning, the WG has taken decisions on how the programme was to be implemented, what would be the procedures, staff requirements, and deputations. The WG has delved into matters of grass lease pricing and mechanisms; need, types, and schedule of training; status of dams, ways to repair them and revive proper management practices; requirements of bamboo basket makers and availability of bamboo versus the rights and responsibilities of basket makers and their quota of bamboos; formation of new HRMS; conflicts and sharing arrangements between the HRMS; roles of field staff and drawing up of JMA and Range and Block profiles. Initially, the WG met at frequent intervals, serving the need of close monitoring by the senior officers working together with their subordinates (Gupta, Undated).

The idea to have a Divisional WG to facilitate the day-to-day working of the programme and to meet more frequently, emerged during a workshop on *Institutional Planning and Research Network* held in Pinjore during 2–4 September 1991. The Divisional WG is convened under the chairmanship of the DFO and the members include the JMU Coordinator, all range forest officers (RFOs), and a TERI representative. While the district-level working groups (DLWGs) were set up in Yamunanagar also, range-level working groups (RLWGs) were set up to further streamline and facilitate the working. The RLWG has the Range Officer (RO) as the chairperson and the members include all deputy ROs/block officers (BOs)/forest guards (FGs) of the range, representatives from the respective HRMS of the range, and TERI representatives.

The organization of WGs at the range, divisional, and state levels helps in quick redressal of relevant issues at the particular stage itself, thus, speeding up the process. The decentralized decision-making also helps in fostering the spirit of ownership and onus of the programme amongst the field staff. The sorting out of matters at the range and divisional levels also filters issues to be forwarded to the WG at the state level.

Joint Management Unit

The HRMS Support Unit, with personnel deputed from the HFD, evolved gradually. Following the formalization of the JFMP, the unit came to be headed by an HFD officer [rank of Assistant Conservator of Forests (ACF)] attached to the CF, Territorial, North Circle. The temporary nature of the assignment of the staff to the Unit posed a constraint in terms of adequate time allocation and commitment by the staff; also the line of authority was nebulous. Only some of these constraints could be overcome. However, the Unit was provided back-up support by the TERI resource team.

The purpose behind establishing JMUs at Pinjore for the Morni-Pinjore forest division and at Yamunanagar for the Yamunanagar forest division was two-fold: one to implement the programme, and another to facilitate a better working relationship between the HFD and the HRMS. Moreover, as the external resource team was expected to play a facilitating and time-bound role only, it was imperative for the department to not only develop the capability to manage the various aspects of the programme on its own, but also have a means to ensure commitment to the programme right from the inception stage. In the later years, there was no other full-time or substantially part-time staff from the HFD at the JMUs. Most of the working of the Unit came to be looked after by the resource persons from TERI. In fact, in the later years of the programme, in absence of an adequate ownership of the programme activities by the divisional staff, the resource team had to gradually undertake a more than supportive role.

TERI resource team

The TERI resource team has been at the forefront of programme initiatives and activities. With the to-and-fro movement of the FD personnel on deputation at the JMU, the resource team had to take up greater responsibility. Thus, the tasks performed by the TERI resource team ranged from being merely facilitative in nature to getting involved in actual implementation. Broadly, the team was involved in:

- constituting, developing, and establishing societies through contact visits, rapport and capacity building, i.e., activities within the ambit of institutional development (building and strengthening) at the local level for effective resource management;
- capacity building and attitudinal orientation amongst HFD staff and officers through training programmes, visits, and discussions;
- detailed documentation by practising process documentation of village meetings, working group meetings, workshops, etc.;

- facilitating communication across the vertical and horizontal levels in the department and outside the department regarding programme issues and impediments;
- information dissemination through newsletters, publications, and workshops; and
- extensive research on socio-economic, institutional, and ecological issues.

The resource team at the field level consisted of researchers from TERI at the field offices at Pinjore and Yamunanagar. Apart from the team members, the JMUs at Pinjore and Yamunanagar also had a full-time consultant/senior researcher, mainly for liaison and coordination work, apart from the regular institutional development work. Most of the team members were postgraduates drawn from the fields of forestry management, social science, and forestry.

Entrusted with the basic agenda of strengthening the institutional set-up, the resource team undertook scheduled and unscheduled visits to the HRMS for finding out the state of affairs and pursuing matters with the HRMS members and the HFD. During village visits, the team, comprising two-to-three persons from TERI, had formal and informal meetings with the HRMS members, individually or in small groups, and the village as a whole. They also met the field staff of HFD in the village or in their offices. The HFD Coordinator and the field staff (the concerned forest guard and BO usually, and the RO at times) were also a part of the team visiting the village, where and when available. The TERI resource team was also involved in imparting training to the members and office-bearers of the HRMS as well as to the field and senior office staff through regular training programmes/workshops/camps. These workshops and camps were important in capacity-building of the village community and department staff.

In the village visits, the Process Documentation team interacted with men and women of different age and caste groups, visiting them at their homes, often meeting their families, and visiting the forest areas along with some of them to evolve a better understanding and relationship. The members of the team fulfilled the roles of a process documenter, a programme facilitator, and a researcher, and were required to possess skills for each of these roles. As a programme facilitator, having to strengthen the institutional set-up and help implement the programme, the team members had to coordinate, liaise with, motivate, and reorient the parties (the villagers and the HFD) involved in JFMP. They had to possess a clear understanding of JFM and its implications, express themselves clearly, understand the views and interests of all, know when to be pro-active, be able to motivate the group to arrive at consensual decisions, and, without asserting, let the programme take its shape. As researchers, they were to be observant and alive to what was happening, collect relevant data, be able to analyse issues in a non-partisan manner and disseminate and convince people, about their research findings and its implications. As a process documenter, they had to possess good listening skills, sensitivity, a good memory, powers of expression and observation, writing skills, an unbiased approach to objectively record the happenings while describing the context and the actors appropriately, and the ability to cull issues that merited importance. As the same person was playing all these roles, a mix of these skills was essential in a balanced manner.

Strategies and mechanisms for implementing the JFMP

In the reciprocal relationship envisaged between the local people and the SFD, certain strategies were adopted to ensure acceptance of the JFM concept and for implementing the programme. Training workshops and camps, village-level meetings between village community and the HFD, inter-HRMS meetings and discussions, microplanning exercises, process documentation, publicity and extension, field studies and emphasis on women's participation were among the prominent strategies.

The search for appropriate mechanisms for community participation in forest management started very early in the programme. Formally, the OT, set up in 1989, selected five villages, each having a different resource base: Godam for bamboo, Kahinwala for leasing of *bhabbar* grass, Khoi for a *kuhl*-based water sharing system, Nandpur-Kedarpur for dam-based resource management, and Kona for a fodder grass-based leasing system; to start preliminary work in cooperation with the local department staff. The idea was to understand the Pinjore range in its variability and to accordingly, develop community management and planning methods and the arrangements for sharing the production from the forest areas. This experience also provided a feedback for the policy proposal regarding the rights of people, the benefits that could be shared, the roles and responsibilities of the community and the department, the basis for sharing, etc.

As part of the diagnostic steps to initiate JFM, profiles of forest ranges and plans at the block level were drawn up. A preliminary profile of the Pinjore range was made earlier and after the involvement of TERI, a profile of Morni range was completed. Work on the Kaleshar range profile was started. The methodology involved an informal interaction with the field staff (BOs and FGs) at the range level. A general picture of the forest blocks was obtained and then visits were made to the villages in each block. Village-level discussions and data about the village were collected. Mapping and other participatory appraisal methods were made use of. Workshops held at the range and block levels helped in the groundwork for range profiles and block plans, besides serving as a fora for training of the field staff at these levels. The block plans helped in identifying the joint management options by analysing the community needs and use patterns for forest resources.

Programme learning slowly added to the method and procedures for organizing joint management programmes. In order to develop community organizing procedures that could be replicated by the territorial staff, microplanning workshops were held at the village level (Gupta, Undated). This also revealed people's perceptions about the components of the programme. Staff of the range, block, and beat levels were present and field-mapping exercises were undertaken. Very briefly, the procedures for organizing joint management at the field-level include:

- drawing up a preliminary beat-level profile—by mapping and other exercises of data collection with local people's involvement. The idea is to generate basic information about and the possibilities of JFM in the beat. It also helps in

introducing JFM to the villagers. Basic data are collected by the FG and with the help of the base maps, location, use, condition, and irrigation maps are prepared in consultation with the villagers;
- discussing JFM with the village community at village-level meetings;
- formation of a society;
- drawing a micro plan with a map depicting the area proposed for joint management (grass lease areas, site for dam, degraded areas to be developed, etc.); and
- formalizing the JMA.

The JMA signifies the understanding between the villagers and the HFD for the basic components of joint management of forest areas. The JMA is signed by the DFO on behalf of the HFD and the HRMS office-bearers. The JMA outlines the responsibilities and the terms of agreement between both the parties.

Capacity building

Capacity building is at the root of a programme like JFM. The different approach and the concept of JFM require a gradual process of developing the necessary attitude, skills, and ways. Thus, for a government department which had hitherto not undertaken such programmes on a regular basis in the past, it became necessary to allow for measures to help its staff and officers to develop the competence to deal with the different nature of programme activities. Capacity building is also imperative for programmes where the role of community institutions is prominent. The participatory nature of work envisaged in the JFMP necessitates that the members of community institutions possess the skills and awareness to add their bit to the programme. Imparting training is one of the measures of capacity building.

In over seven years of its involvement in Haryana, TERI gave particular attention to training in JFM, as it is an essential feature for making the programme successful and acceptable to the concerned parties, namely the HFD and the HRMS. Regular training workshops were an integral part of TERI's strategy for institutional development and capacity building under the JFMP. Training inputs are crucial both in the initial and later stages of any development programme. Training programmes provide the thrust and direction initially and, later on, helps in sustaining the interests of the parties involved by providing a forum for exchanging their ideas.

TERI's training initiatives started way back in 1990. Over the years, these initiatives grew into a more regular feature, with TERI undertaking training-cum-awareness programmes in close collaboration with the HFD, while deciding the syllabi, structure, and schedule of the workshops. Over the years, the efforts and experience in training crystallized into more formal and organized, need-based training intervention, especially in the context of the content, syllabus, duration, method, and category of training. The training programmes organized by TERI have been tailor-made to suit the needs of different categories of stakeholders like the village community members (farmers' training camps), HRMS office-bearers and/or the Management Committee (MC) members, field-level staff of HFD

(FGs, foresters, deputy rangers, BOs), ROs of HFD, senior officers of the department (from the DFO to the CCF, PCCF level), and the women members of the HRMS in the village.

The different types of training programmes, their objectives, the participant profile, training method and materials, resource persons, duration of the courses and other details are given in Table 1. Broadly, the training programmes are of two types: orientation training and knowledge-based training. Orientation training aims at attitudinal orientation for JFM. It is conducted on general aspects and concept of JFM, to raise awareness about JFM and for attitudinal transformation towards a greater involvement in JFM. Aspects of sustainable forest resource conservation and utilization, historical perspective of JFM in Haryana, and the need for JFM are covered. Knowledge-based trainings help impart information about the procedures and operations under the JFMP. The trainings focus on the formation, structure, management, roles and responsibilities of HRMS members, operational matters like record keeping, elections, etc. Skills in participatory methods for interacting with rural communities are also covered.

In 1995, based on the felt-need of the department and particularly that for programme growth and requirements, TERI introduced courses on specific topics meriting detailed technical training sessions on (1) baseline vegetation survey of forest resources, and the (2) repair, construction, and management of dams. These topics are very important in focusing the attention and efforts of local communities and department on these two vital aspects of JFM in Haryana. The marginal status of women in the rural set-up, makes it difficult for them to interact freely in public meetings. Recognizing the potential and necessity for their greater involvement in JFM, TERI undertook special training programmes for only women on JFM, in the village in an informal and interactive manner.

As an indicator, in terms of numbers of trainings conducted in a year (June 1995 to March 1996 as an example), there have been 160 participants (field-level staff) from the HFD and 332 participants from the HRMS (including 117 women) in the regular training programmes. A significant number of HRMS members and HFD staff have been trained through more organized, routine, and intensive courses as part of the training programme. Regular programmes were conducted, spaced over every month from June to March. In all, 19 training workshops/ camps were held in that year for the members of the HRMS and the officers and staff of the HFD. Such training programmes were carried out by TERI every year.

The very nature of trainings remained interactive, where responses and queries were encouraged and feedback was taken from the participants. Needless to say, such training sessions went a long way in providing the initial thrust and direction to the JFMP, and in the later stages, helped in sustaining the interest of the concerned parties by providing them a forum to stay in touch and in bringing about suitable modifications through such interactions.

The involvement of the HFD in training programmes was appreciable at all levels. Training on JFM became a regular feature of the training courses of the FGs and the foresters' trainee batches of the HFD every year. Prompted by the openness in trainings, where the staff could openly voice their doubts without

Table 1. Details of training programmes conducted by TERI

Name of the training programme	Objective	Resource persons	Training material/method
Training Workshop on JPFM for members of MC of HRMS	Orientation to JFM policy, rules, structure, framework of HRMS, rights, responsibilities of members	HFD (2–4 officers and staff); TERI resource team	Publications on JFM and HRMS in simple language; field visit discussions
Training Workshop on JPFM for ROs of HFD	Orientation of JFM policy, rules, programmes; the role of individuals in JFMP	HFD officers; TERI resource team	Publications on JFM policy, rules, PRA, etc. Discussion; class lecture; field visits
Training Workshops on JPFM for – Block Officers/Deputy Rangers – Block Officers/Field Staff – Deputy Rangers/Foresters/Forest Guards – Foresters – Forest Guards	Orientation of JFM; role and responsibility in JFM; attitudinal orientation	HFD (CCF, CF, Surveyor, VFW); TERI resource team; and CSWCRTI scientists	Publications on JFM rules, policy, PRA methods; Class lectures; Discussion; field visits for PRA; micro-planning exercise
Farmers' Training Camp of JFM	Disseminate knowledge and skills to farmers about protection and management of forests on sustainable lines. Systematic management of society. Exposure to plantation and nursery activities of R&T Division	HFD (JMU coordinator, ACF, RO, FG, Forester); TERI resource team	Discussion. Field visit to HFD nursery and plantation sites
Training Workshop on Baseline Vegetation Survey and Microplanning	Imparting knowledge and skill in conducting baseline survey in JFM sites	HFD (1–2 officers, surveyor); TERI resource team	Lecture; discussion; Field exercises
State-level Workshop on JPFM	Review progress/programme undertaken in the last three years Delineate strength and weaknesses and success of the programme. Discuss future strategies/programmes, identify facilitatory factors		Discussion; Publications on JFM

(Continued)

Table 1 *(Continued)*

Name of the training programme	Objective	Resource persons	Training material/method
Senior Officers' Workshops on JFM	Review and discuss the performance of JFMP in Haryana and define its future direction		JFM publications; discussion.
Training workshops on Construction and Maintenance of Dams under JFM for HFD Staff and HRMS Representatives	Impart knowledge on structural and functional aspects of dam repair, construction, and maintenance to that staff of the HDF (field and other) which is involved in the design and execution, in an attempt to revitalize institutions and improve the status/management of the existing dams	CSWCRTI scientists and technical officers; HFD senior officers (CF, CCF); TERI resource team; scientist from Punjab Agriculture University	Lecture sessions; field visits to dam sites; notes; discussions with society members

ACF	Assistant Conservator of Forests
CCF	Chief Conservator of Forests
DC	Deputy Commissioner
FG	Forest Guard
HRMS	Hill Resource Management Society
MC	Management Committee
PRA	Participatory Rural Appraisal
R&T	Research and Training
CF	Conservator of Forests
CSWCRT I	Central Soil and Water Conservation Research and Training Institute, Chandigarh
DFO	Divisional Forest Officer
HFD	Haryana Forest Department
JPFM	Joint/Participatory Forest Management
PCCF	Principal Chief Conservator of Forests
RO	Range Officer
VFW	Village Forest Worker

the fear of any repercussions, these trainings provided a venue for local field staff to go back with a changed mind-set or at least take a step towards that. Another noticeable achievement was the increased contribution and involvement of the senior officers as resource persons in the training sessions. In most cases of training workshops, officers of the level of DFO to the CCF took the onus of addressing the trainees, thus providing a closer link between the department and the people and also, between the lower and upper department functionaries. Involvement of senior persons reinforced the seriousness about JFMP amongst the trainees.

Resource persons from TERI played a very important role in organizing and conducting training programmes, and in imparting skills on participatory methods and in bringing about awareness and attitudinal reorientation towards JFM. The TERI resource team also worked towards the involvement of the HFD personnel in training programmes. The senior officers of the HFD, besides staff members (as the surveyors and draftsman), contributed considerably as resource persons in JFM trainings. Scientists and technical officers of the Central Soil and Water Conservation Research and Training Institute and scientists of the Punjab Agriculture University (PAU), also provided tremendous inputs as resource persons in the training workshops.

Every training workshop was documented and a training report produced, which was then circulated to the HFD staff, the FF, and the participants. The training reports corresponded to the different trainings conducted on JPFM for the management committee members of the HRMS, field staff of HFD (foresters/FGs/BOs/deputy rangers), ROs, farmers' training camps, women; on baseline vegetation survey, and on construction and maintenance of dams under the JFM. Besides these reports, the proceedings of the senior officers' workshop and the workshops on microplanning and process documentation have been brought out as a series of publications on JFM by TERI.

The large numbers and the varied types of players and stakeholders in the gamut of JFM pose a constraint in generating a universal impact of training. The existing attitudes, mind-sets, perceptions, and behavioural patterns, coupled with the inhibitions posed by social norms, practices, and taboos further add to the complexity of the task. The solution to these problems lies in balancing judiciously, the limited resources, training staff, and time for training activities in the above context and with the other activities under the programme. Despite the vast reach of training programmes across the various levels of the department and the HRMS, and the large numbers given intensive training every year, the need for *reiteration* exists. This is particularly important as JFM implies a new approach.

Although there was an effort to impart training to as many field functionaries of the HFD, especially those posted in JFM areas in Haryana Shivaliks, through a process of selection of trainees by the HFD, it has not been possible to provide training opportunities to *each and every* functionary, particularly the field staff posted in distant areas, such as the plains of Haryana. In order to overcome this drawback and the situation that may arise out of mass transfers, the training programmes were aimed at incorporating those who are (1) posted in JFM sites,

(2) the regular trainee batches of FGs and foresters of the Research & Training Division of the HFD, and (3) some selected field staff from across the state of Haryana.

In the case of the HRMS members also, the need for reiterative training exists, especially when new members take up the task of office-bearers of the society. Also, it is necessary to train men and women in the village repeatedly, catering to their special needs and position in the village, so that their awareness and interest do not abate.

An important feature of the training programmes proposed for the final phase of TERI's involvement in the Haryana JFM is the training of trainers. A great deal of emphasis is on capacity building within the HFD for equipping them with training capabilities to continue this process. The HFD staff would be responsible for undertaking trainings not only for the HFD staff but also the HRMS members and other stakeholders on different aspects as mentioned earlier.

Process documentation and communication in JFMP

The JFM is a participatory programme having a broad objective of development of natural resources (degraded forests) and of the communities dependent on them. To actualize the approach advocated and to realize the goals of the programme on JFM, it is essential that firstly, the capabilities and skills of the local communities in effectively managing their forest resources are enhanced; secondly, the management capability of the concerned development agency (a government department like the FD or an NGO), which is responsible for implementing the programme, is upgraded to meet the programme requirements.

With the JFM conceived as a programme involving repetition of certain activities over an indefinite (long) time-span, and not a time-bound project, it became imperative to aid the HFD (the primary implementing agency) in adequately managing the programme. In order that field experiences, both successes and failures, are fed into the implementation process the social learning approach has been adopted. The use of process documentation and rapid appraisal methods along with workshops and working groups were adopted. Process documentation—a tool to help development organizations to learn from their own experience involving data collection, processing, and reporting—was successfully adopted in Haryana. The process documentation notes for the periods before TERI's involvement, and TERI's first and second phases provide the early scenario of the JFM, the problems at the village and departmental levels, what steps were suggested to overcome those problems, the issues and concerns of the villagers and how these were addressed, the reasons, the rationale of taking certain decisions, etc.

A planning workshop was organized by TERI, the HFD, and FF during 2–4 September 1991, on 'Institutional Change Research Network', reflecting the importance of process documentation, wherein discussions on channels and methodologies for speedy collection of data, documentation, and dissemination of the field experiences for timely and appropriate decisions. On the Haryana JFM, documentation has been done with a view to:

- maintain for each HRMS, *per se*, a chronological record as far as possible,
- communicating to all those concerned with the development and implementation of the programme, the details of the grassroots occurrences in a 'see-it with-your-own-eye' manner; and
- facilitate and speed up the corrections/improvements in the implementation of the programme.

The TERI resource team carried out process documentation of the visits to the villages, the meetings and discussions held at the village level, with the field staff and officers of the HFD, in the WGs and in the training workshops and camps. In order to facilitate communication of field events and concerns to those in and outside the HFD, gradually a uniform format was developed for writing the process documentation reports. This format allowed for an analytical presentation of the field information. The organized manner of sorting out the information helped in meeting the needs of the readers primarily, the HFD officials, and, thus, draw their attention to issues of concern. The general format of the village reports is given in Box 1. The training programmes too were documented in detail and a training report was produced for each. The format for the training report was also generalized and varied to some extent only, depending on the type of the training programme.

Thus, information about the field situation and developments reached across a wide vertical and lateral span with the process documentation reports being circulated in the HFD, TERI, and the FF. The *JFM Samachar Patrika* (a newsletter) is an attempt to reach out with the process documentation to the HRMS as well.

Issues highlighted through process documentation were referred to the appropriate fora and solutions were sought. Many of the arrangements in the JFMP are an outcome of such a communication and decision system where information was routinely fed into the programme machinery and acted upon. Thus, process documentation played a very important role in not only communication but also in monitoring and navigation of the programme. The system allowed feedback at regular intervals and modifications without going through the traditional bureaucratic functioning of the department. Reaching out to all concerned by distributing the process documentation reports ensured greater transparency and information sharing. Based on the feedback and the issues brought to light by process documentation, the state WG made recommendations having a bearing on policy matters to the Government of Haryana.

Research

Another outcome of the process documentation exercises has been the JFM series which has case studies, proceedings, etc., that highlight the different aspects of the programme. While some look at the impact of protection on the forest

Box 1. Format for the village or field reports of TERI

The minutes of the meeting held at village ---- on -----

1. Present
2. Agenda/issues/objectives
3. Discussions on agenda/issues/objectives
4. Decisions taken
5. Issues for range working group
6. Issues for divisional working group
7. Issues for state working group
8. Any other comments

Signature

CC

1. -----, PCCF
2. -----, Director, Forestry Operations
3. -----, CF (Social Forestry)
4. -----, CF (Head Quarters)
5. -----, CF (Development)
6. -----, CF (North)
7. -----, DFO (Morni-Pinjore Division)
8. -----, DFO (Yamunanagar Division)
9. -----, Coordinator, JMU, Pinjore
10. ----, Coordinator, JMU, Yamunanagar
11. ----, RO, Range (concerned)
12. ----, Ford Foundation
13. ----, Director, TERI
14. ----, Project Coordinator, TERI
15. ----, Consultant, TERI
16. ----, All JFM professionals, TERI

productivity, others look at the benefits that different stakeholders have derived from the programme. The documents, brought out so far, are entitled as below:

1. Grass yield under community participation in Haryana Shivaliks
2. Impact of participatory forest management on the ecology of Shivalik hills in Haryana State
3. Economics of bamboo basket-making: a case study
4. Economics of goat and buffalo rearing: a case study from Haryana
5. Yield of *bhabbar* and grasses from the areas managed by HRMS and Ballarpur paper mill: a comparative analysis
6. Management of bamboo forest under Joint Participatory Forest Management Programme (JPFMP) in Haryana
7. Systems of *bhabbar* grass lease management in Haryana
8. Effect of juvenile grass cuttings on fibre yield of *bhabbar* and hay yield of fodder grasses in Shivalik hills of Haryana
9. Economics of rope making under participatory forest management
10. Pisciculture under JPFMP in Haryana

11. Women as partners in the regeneration of Haryana Shivaliks
12. Constraints in the implementation of JPFMP—some lessons from Haryana
13. Women in Godam, Haryana: a gender and caste-based study on conservation of forest resources
14. A dynamic process of institution development in Lohgarh village in Haryana
15. JFM in Haryana: workshop proceedings
16. Rehabilitation of degraded tropical forest watersheds with people's participation
17. Ecological revival of Haryana Shivaliks through community participation
18. Institutional, legal, and socio-economic impacts of community participation in Haryana Shivaliks
19. People's participation
20. Assessment of training needs of frontline forestry staff: a JFM perspective
21. Effect of community participation on the status of bamboo in Pinjore forest range, Haryana
22. Microplanning in JFM
23. Role of community institutions in fire control in Haryana
24. Process documentation: the JFM experience

A microplanning manual for JFM areas has also been brought out. The programme in Haryana has gone through three distinct phases, the pre-TERI phase, TERI's first and second phase, and the final withdrawal phase which is on-going. The seven years of TERI's involvement have seen a lot of happenings. Many systems have been put into place for the JFM programme to move forward. Capacity building of the HFD and HRMSs have reached stages where the two crucial actors in the programme would successfully carry the programme forward. And, all this has been possible only because of the time and efforts put by all those concerned in the years gone by into positioning this system in place.

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Systems for Forest Management

Introduction

The link between the people and natural resources, especially in the rural areas dates back several centuries and assumes various forms. Edible plants, indigenous medicines and spices, hunting of animals, bamboos, stones, wood, etc., for making small implements, and other household items have been based on the resources available free in nature. Forests have always been the main resource for meeting these diverse needs.

The dependence of people on forest resources of their areas, and the essential link between the natural resources and the socio-economic set-up of these communities, have been recognized in the form of traditional rights and concessions granted by the governments, which admit to the legitimacy of such dependencies (Box 1).

Box 1. Traditional forest rights and concessions in Haryana

Traditionally, the local communities have enjoyed certain rights and concessions, as stipulated under the forest settlements with regard to the usufruct in forest areas in the Shivaliks. Primarily, the rights include collecting fodder, dead and dry wood for fuel; to lop one-third of a tree from ground for fodder; for grazing a fixed number of animals in the forest areas; and of passage for humans and livestock.

Additionally, the settlement stipulates the species to be used for various purposes and, in case of grazing in forest areas, the number and type of livestock that could graze in adjoining forests.

The concessions are in the form of wood for agricultural implements once annually; timber for constructional purposes, once in 10 years for construction purposes and once in five years for repair and maintenance of houses, with due permissions from forest department; and timber for cremation purposes, etc. All the rights and concessions have been finalized through a consultative mechanism, keeping in view the needs and requirements of the village and the capacity of the forests.

Source. Singh (1937/38).

However, over the years, forests have been overexploited to meet the increased demand for fuel, fodder, and timber as a result of increasing human and cattle populations. Initiated to check further degradation of the forest resource, the Joint Forest Management Programme (JFMP) in Haryana motivates villagers to protect and conserve the forest. The basis of Joint Forest Management (JFM) in Haryana, and in other parts of the country where the Joint Participatory Forest Management Programme (JPFMP) is being promoted, is the protection provided by the local village/user community for the enhancement and sustainability of forest resources. The protection provided could be through a voluntary ban on open grazing in forest areas and on illicit felling of trees for timber and fuel.

An overview of the different incentives offered to Hill Resource Management Societies (HRMSs) under the programme reveals that the socio-economic condition of the forest-dependent community has improved. This is important as poverty is a major factor affecting forest rehabilitation. Irrigation water from water-harvesting structures has helped in the manifold increase in agricultural productivity. Increasing yields have also provided for greater agricultural residue used as fodder supplement. Along with increased fodder grass availability from the forests, villagers have shifted to rearing high-yielding milch cattle in place of low-yielding and grazing livestock.

Bhanjdas (basket makers), with an increased bamboo supply at concessional prices, have been able to increase basket production and sales, yielding greater income. This has improved their lot considerably. Apart from individual families, the infrastructure of the villages has also improved with the profits from the fibre grass leases being put to this purpose. Also, the fuelwood required is obtained from the forests in the form of dead and fallen wood, whose availability has also increased owing to the greater number of trees. All this has definitely improved the people's socio-economic condition, which, in turn, has helped in improving the health of the forests and in increasing biomass production.

The management of the forests for this forest produce, and the arrangement between the Haryana Forest Department (HFD) and the HRMSs are clearly drawn out and agreed upon. This agreement, is referred to as the Joint Management Agreement (JMA). Under the JMA between the local village community and the HFD which is represented by the concerned Divisional Forest Officer (DFO), the village community agrees to restrict their traditional rights and concessions stipulated under the forest settlement, based on the understanding that this practice will help to enhance the resource base.

Joint Management Agreement

With the 1990 Government Order on JFM, a socio-political climate evolved, which was conducive for the emergence of a collaboration between the Forest Department (FD) and the dependent communities for forest management. The JFM approach has led to the development of partnerships between local institutions and FDs for the sustainable management of forest areas on the basis of mutually defined rights and responsibilities of both parties.

Subject to the willingness of a majority of households of the concerned unit to accept responsibility for joint management of the specific forest area in their vicinity, the HFD, in collaboration with the villagers, prepared a development-cum-management area to be brought under joint management with the HRMS. Efforts were also made to ensure that only HRMS members have rights in that area and this was done in order to prevent potential conflicts with other right holders.

Among the significant cornerstones of the partnership between the HFD and the HRMS are mutual acceptance of clearly defined rights, responsibilities, and accountability. This has essentially led to a shift from centralized, top-down planning and authority, to the development of a capacity for decentralized decision-making responsive to the diversity of local needs and priorities—a planning process that is flexible and sensitive. The HFD has played an additional role of guiding and nurturing the development of strong, sustainable, and autonomous local institutions. On the other hand, HRMSs have risen above individual interests and contributed to the development and strengthening of their own institutional capacity to sustainably manage forest resources on transparent principles of equity and accountability. This is a departure from the generally inadequate performance of government-sponsored local institutions in India largely due to their not being founded on sound participatory and democratic principles.

The significant features of the JMA between the HRMS and the HFD are listed below:

1. The JMA defines the basis of JFM between each HRMS and the HFD.
2. On behalf of the HRMS, a JMA is signed by two or more of its elected Management Committee (MC) members authorized for the purpose.
3. On behalf of the Government of Haryana, the concerned DFO signs the JMA.
4. Each JMA specifies the following:
   - a clearly delineated forest area (to be shown on a map with its area in hectares and its existing condition) as the Management Area (MA) to be jointly managed by the HFD and the concerned HRMS;
   - a management plan for the MA shall be evolved for sharing timber in consultation with the concerned HRMS. For sharing water, fodder grasses, *bhabbar*, bamboo or any other forest produce which has a rotation less than five years, the preparation of a management plan is optional; and
   - the rights and responsibilities of both parties including benefit-sharing is in accordance with the norms outlined in JMA.

Responsibilities of the HFD and the HRMS under the JMA

Though the individual responsibilities of HFD and HRMS under the JFM programme has been detailed in another chapter, the responsibilities of HFD and HRMS under JMA is detailed below.

Responsibilities of the HFD

1. To provide wide publicity for adopting JFM policy to villagers living in or near forest areas, and follow specific procedures while reaching JMAs.
2. The HFD is responsible for coordinating with other departments and HRMS in order to carry out tasks in JMA areas. JMAs are incorporated into working plans.
3. The HFD personnel should facilitate HRMS functioning by taking prompt action against any instances of persons willfully causing damage or attempting theft of forest produce from the MA, which are brought to the notice of the staff by HRMS.
4. Regular training to mould the attitude and skills of HFD personnel for implementing the joint management policy, for involving women and weaker sections in the programme.
5. To assist HRMS to develop administrative, managerial, and technical capability to execute their responsibility, including promotion of women's participation.
6. To regularly monitor changes in yield of forest produce from areas brought under joint management.
7. Where a water-harvesting dam or *Kuhl* system is to be built under the Joint Management Programme (JMP), to involve HRMS members in site selection and command area pipe layout, ensuring equitable free distribution of water. HFD also has to ensure the delivery of a complete and functioning dam system for HRMS.
8. To share benefits of forest produce or income from MA with the concerned HRMS according to each JMA.
9. The HFD may permit sale of surplus biomass/grasses produced by the HRMS.

Responsibilities of the HRMS

1. To assist HFD personnel in developing a management plan through participatory microplanning. Bonafide domestic needs of the members for forest produce traditionally used by them are to be met, as per the JMA. The subsistence needs of the economically disadvantaged members are to be adequately met.
2. To assist HFD personnel in the execution of forestry works as specified in the JMA by utilizing funds provided in the plan budget. Funds from independent sources such as the National Wastelands Development Board (NWDB), National Afforestation and Ecodevelopment Board (NAEB), Council for Advancement of People's Action and Rural Technology (CAPART), and National Bank for Agriculture and Rural Development (NABARD) or any other donor agency authorized by the government, may be sought by the HRMS to execute forestry work in its MA under the supervision of the HFD personnel.
3. Where appropriate, to invest a part of its cash income from the sale of forest produce for further improvement of the MA.
4. To honour all its commitments made in the JMA and to protect its MA from encroachment, cultivation, grazing, fire and illicit felling or willfully causing death of trees by girdling. For this, it shall evolve a code of conduct for its members and levy or prescribe penalties for those members violating the code.

To inform HFD personnel of any person(s), particularly non-members, willfully causing damage in its MA or attempting theft of its produce.

5. Where the HFD has built a water-harvesting dam or a *kuhl* system; to manage water distribution from it on an equitable basis and take care of minor repairs and maintenance. All members of an HRMS may have the right to claim an equal share of water irrespective of whether they own the land or not. By levying water charges on its members, the HRMS can generate funds in areas where funds are not available with HFD. During the rainy season, to keep a vigil on the dam and in case of any breach or chance of a breach in the dam, to immediately inform the beat forest guard and take all protective measures to save the dam.
6. To bring to the notice of HFD personnel, a decline in productivity of its MA due to various causes such as the proliferation of *Lantana* and *Parthenium*, and assist in devising ways to control/uproot such species.
7. To assist HFD personnel in resolving conflicts with residents of the neighbouring villages over competing claims in the MA.
8. In consultation with the concerned Range Forest Officer (RFO) to evolve rules for its members for the collection/harvesting of forest produce such as fodder, grasses, dry and fallen wood, small timber and poles, and carrying out pruning, thinning from its MA, in a manner which ensures sustainable yields from the area. As a general rule, each HRMS shall ensure that the bonafide domestic needs of its members for forest produce from its MA are met before it considers sale of any such produce.

Conditions for the extraction of forest produce as specified in the JMA

The conditions that have been laid down for the extraction of different forest produce in JMA are highlighted below. These have been quoted from the terms and conditions specified in the JMA.

General conditions for cutting bhabbar *and fodder grass*

The HRMS agrees that:

- any collection or removal of the *bhabbar* grass from the MA shall be done only after sunrise and before sunset;
- the grass shall be cut with sickles and not uprooted;
- no obstruction to roads and paths in the forest area shall be caused; and
- no animals or carts shall be employed for removing *bhabbar* or grass from the forest area without the previous written permission of the forest officer.
- In case of the HRMS(s) being unable or unwilling to purchase the grass and/or *bhabbar* in any particular year, its office-bearers agree to inform the Forest Officer about this latest by a specified date. The government shall then be at liberty to auction the above produce to the highest bidder for only that particular year.

Share of HRMS's income from sale of timber, bamboo, etc. from joint management areas

After 10 years of JFM, to the satisfaction of the Conservator of Forests of that area, the HFD may share its gross sale income from forest produce such as timber, from final felling. In case of bamboo, the period shall be four years from the commencement of the JFM agreement.

1. Where the MA was reasonably well stocked (0.4 average density) at the beginning of joint management, 25% of the gross sale proceeds.
2. Where the MA was badly degraded at the beginning of joint management and has been rehabilitated/restocked with the participation of an HRMS, 50% of the gross sale proceeds.

Benefit-sharing with existing HRMSs participating in JFM before notification of these rules

Sharing the benefits of the forest produce with older HRMSs on the above terms shall be at the discretion of the Conservator of Forests for the registered societies already in existence prior to the notification of these rules.

Bamboo HRMS

Following are the responsibilities of the bamboo HRMS.

1. An HRMS of bamboo artisans agrees to take particular care to minimize the danger of fire in the MA during the fire season from 1 April to 30 June every year in the JMA. No dry bamboo shavings shall be left in the forest during this period. In case a fire breaks out, the HRMS members agree to assist HFD staff in putting it out as soon as possible.
2. The HRMS members agree to undertake the cleaning of bamboo clumps simultaneously while cutting their quota of bamboos to maintain the clumps in a healthy and productive state.
3. The HRMS members agree not to cut bamboos from 1 July to 30 September every year.
4. While cutting bamboos, the HRMS members agree to follow the felling rules prescribed by the HFD.
5. The HRMS members agree to use the bamboos cut by them only for the manufacture of bamboo articles locally and not for re-sale or barter of unprocessed bamboos.

Following are the responsibilities of the government to the bamboo HRMS.

1. It will ensure that the MA is adequate for meeting the bamboo requirements of the HRMS members.

2. It will employ only the HRMS members to carry out planting and cultural operations in the MA, if and when available. The Conservator of Forests of that area shall have the discretion to share any or all of the benefits before the prescribed period but not before the date of registration of the Society.
3. During the period when felling is not permitted (1 July to 30 September), it will give first priority to employing the HRMS members on daily wages on its ongoing works in the area.
4. It will ensure that felling (if any) undertaken in the area by the Production Division of the HFD is restricted only to the types of bamboo not required by the HRMS members, and that only the HRMS members are employed to do the felling, if and when available.
5. It will take necessary action against outsiders caught damaging the MA by the HRMS members.

The rules that have been framed for the operationalization of the JFMP in the state provide for all members of HRMSs to collect dry and fallen wood, fencing material and limited numbers of bamboo and poles free of cost from their respective MA for their bonafide domestic use and not for sale. Provided that, previously existing rights of members or non-members are not to be interfered with, the HRMSs shall regulate collection of the forest produce on a sustainable basis by framing rules for their members in consultation with the concerned RFO. While these are provisions under the rules, there are clear guidelines regarding the management of the different incentives that have been described later in this chapter.

Discussion of management practices for forest produce

The Shivalik ecology supports a northern dry mixed deciduous forest with *khair, reru, kikar, shisham, chaal, kaindu, dhak* being common in the area. Among the grass varieties are bamboo, *bhabbar*, and *sarkanda*. Under the JFM initiative, the societies have taken various steps to protect forest-based resources of the area, and improve them through effective management and extraction procedures (Box 2).

Fodder grass

Fodder grass from forests and agricultural land in the programme area constitutes an important source of feed for livestock. Of the 38 HRMSs in Morni-Pinjore Division, barring Kalka where bamboo is the main incentive and livestock population is negligible, 37 HRMSs are dependent on green fodder. While nearly eight per cent of the families graze their animals in the forests, the rest harvest fodder from agricultural and forest land in the ratio 1:0.8 in favour of agricultural land. While 19 villages derive fodder free owing to the concessions granted to them during the settlements, 17 HRMSs pay for the fodder.

Box 2. HRMS initiatives for regeneration and improvement of forests

HRMS	Initiatives taken
Surajpur	Uprooting of *Lantana* in 2 ha of jointly managed forest area, by voluntary labour, to restrict its spread. 1. Have dug more than 1200 pits in the forest area and plan to plant trees of medicinal value in the coming monsoon. 2. Plan to undertake de-siltation and unclogging of the outlet of the dam in the current year.
Govindpur	People have sold off their goats and switched over to buffalo rearing. 1. Have planted *bhabbar* slips in the immediate catchment of dam to prevent soil erosion and siltation. 2. Have got the spill way of the dam repaired.
Raina	Have planted 10 000 seedlings of species of local importance under grant-in-aid scheme of NWDB, with a success rate of over 80%. 1. Have sold off a large number of goats and shifted to buffalo rearing.
Harijan Nada	Have protected 17 ha of degraded land on which *Leucaena leucocephala*, *Eulaliopsis binata*, and *Prosopis juliflora* were planted by the FD. People are now managing and regulating the use of this resource, for fulfilling their bonafide needs of fuelwood, fodder, and small timber.

There have been widespread fluctuations in the availibility and, consequently, the price of fodder over time. Prior to the implementation of the JFMP, fodder prices were often phenomenally high, since the villages which are currently under JFMP had to obtain grass permits from the mills or through contractors, where they did not have the free right for grass. There are even instances where fodder grass was provided in *lieu* of wages for the harvest of *bhabbar* grass, a discriminatory practice since only a few households ended up getting this fodder grass.

The traditional fodder distribution system existing in the area was the *dati* (derived from *darati*, a local word meaning sickle), which is quite unique to this region. Each family obtains a *dati* by paying the set price, which allows one member from each family to visit the forest once in a day and bring out one headload of grass. This is valid from July to March after which the grass flowers and dries out and then the coming of rains leads to regeneration.

With the formation of the HRMS, the *dati* rates were rationalized and villagers were able to get larger quantities of grass for longer time periods essentially because grass production has shown a tremendous increase with protection. The *dati* rates range from as low as Rs 35 at Khudabaksh to as high as Rs 496 at Kona with the average for the HRMS being Rs 243. The maximum consumption levels for individual villages are seen among the *Gujjars, Lawane,* and *Jats* who have maximum livestock holdings and correspondingly the largest fodder requirement. The maximum consumption in any village ranges from 6 quintals (*Gujjar* family) to 0.6 quintals where the *Jats* are dominant. The minimum ranges from 0.4 to 0.15 quintals across villages.

The JMA, as mentioned above, have rationalized the *dati* rates and provided stability to the availability of fodder grass from year to year. The JMA, which regulates the annual purchase of fodder grasses by the HRMS from the HFD, lays down the following rules for fodder grass purchase.

- As a part of its JMA, all fodder grass shall be given to the HRMS at the average price obtained in open auction for the last three years preceding JFM. Where such information is not available, the price shall be settled between the DFO and the HRMS after taking into account the condition of the area and/or the price fetched by similar adjoining areas. Annual increment at the rate of one per cent of the above price is to be paid by HRMS after signing the agreement.
- Payment for the fodder grass shall be made in lumpsum by each HRMS every year.
- In case of an exceptional drought or other natural disasters, the DFO may reduce the price to be paid.

Bamboo

While the bamboo forests in the region have been managed in accordance with the guidelines laid down in the bamboo working circles of the various working plans since 1905 (Table 1), the rights to Bhanjdas for obtaining bamboos from the forest, to support their basket making tradition came through only in 1943 (Dwivedi, Bhatia 1996).

Bamboo rights to the *Bhanjdas*

The *Bhanjdas,* the traditional basket-making community, are dependent on bamboo forests of Thadugarh and Bargodam in Morni-Pinjore Forest Division, for making baskets for their sustenance and employment. The rights recognized in the Minniken's settlement did not include those for harvesting bamboo. The first recognition of the rights of the *Bhanjdas* came as an order passed by the Revenue Minister, Patiala State, in 1943. Details of these and changes over the years are presented in Table 1. In 1943, the Patiala state allowed harvest of 100 bamboos per household annually for a period of six months to the *Bhanjdas.* The bamboos felled from the demarcated protected (DP) forest areas (RF to be untouched) would be used only to manufacture bamboo articles locally with total restriction on re-sale or barter of bamboos. The restriction on bamboo extraction are presented in Table 2.

Under the supervision of forest officials nominated by the RFO for the purpose, felling of bamboos would be restricted to the bigger and dense clumps. All clumps would be cut with sharp instruments within 30 cm from the ground immediately above the node, but it could be higher in certain cases. No *manu* (shoot

Table 1. Bamboo working through the years

Working plan period and author	Working details
1905–35, Fazul-ud-Din	Bamboo felling on a two-year felling cycle; retention of 8 to 10 culms (including *manus*) with a minimum of four bamboos in each clump; felling between November and April
1936–55, Mian Budhi Singh	A felling cycle of three years; 'selection with thinning' system adopted; extraction of rhizomes prohibited; suspension of grazing rights through July to September; cleaning and improvement felling undertaken
1956–64, J D Sharma	Similar to Fazul-ud-Din's plan
1965–80, P S Mallik	Three-year felling cycle; large-scale flowering observed; deterioration in bamboo forests due to non-closure of regenerating areas to prevent grazing, grass cutting, and other uses
1981–83. P S Malik	Felling according to annual plans; no planting
1984–98, Sultan Singh Jatiyan	'Selection-cum-improvement felling' system; felling cycle of three years; emphasis on tending of young and established regeneration, removal of hardwood species that suppress bamboos and improving the quality of bamboos

Source. Dwivedi, Bhatia (1996).

Table 2. Restrictions on bamboo extraction by *Bhanjdas*

Year	Number of bamboos a month for each household	Amount (Rs)	Period of extraction/ year (months)	Months when harvesting is permitted
1943	100	3.12	6	October to March
1973	100	15.00	6	October to March
1979	100	30.00	6	October to March
1979	50	30.00	6	October to March
1991	100	7.00	9	October to June

of the current year) or *chal* (leading exterior shoot) would be cut, and no cut portion of bamboo would be left in the clump. For silvicultural requirements of the crop and soil conservation work, the state government could suspend operation of these rules for a period not exceeding once in three consecutive bamboo felling seasons, as and when necessary.

In 1973, the Government of Haryana allowed the *Bhanjdas* of Kalka and Pargana Chand of Pinjore forest range of Morni-Pinjore Forest Division to harvest 100 bamboos per month per household at market rates for a period of six months in a year. The felling of bamboo would be allowed only from the protected forests (PF) and not from the RF, on condition that these would only be used for the manufacture of bamboo articles locally. Through a notification issued in 1979, the rate of bamboos was increased from Rs 15 to Rs 30 per 100 bamboos. Subsequently, the number of bamboos per permit was reduced to 50. The bamboos are provided to the *Bhanjdas* from the DP forest areas.

Over the years, the extraction of bamboo from forest areas became unsustainable. The major cause of loss of bamboo in the forest areas was forest fires. The other factor that has led to the depletion of this resource is the unscientific extraction for use in paper mills and by the local communities. Hence, under the JMA, the concessions granted to the *Bhanjdas* were revised in 1991 and the felling permit of bamboos was increased from 50 to 100 per family, at Rs 7 per 100 bamboos and the felling season was extended from six to nine months. In lieu of this concession by HFD , the two HRMSs of Kalka and Bargodam have agreed to protect the bamboo forests from grazing and fire. In a decision taken by the *Bhanjdas,* silvicultural cleaning of four clumps of bamboos every month by each permit holder was started. Cleaning includes the removal of dead and dry culms to avoid congestion and facilitate optimal growth of new culms of bamboos and soil working.

During the fire season (May–June), *Bhanjdas* protect their forest from fire. The major cause of destruction of bamboo forest due to fire is from the uncontrolled burning of *ghasnis* for improving grass productivity in the forests and agricultural fields of the adjoining state of Himachal Pradesh.

Management of bamboo areas under JFMP

The bamboo forests near Kalka and Bargodam, the two *Bhanjda* settlements have a mean clump distance of 3.4 m and an average clump number of 854. The average number of culms per clump at 11 compares favourable with the state average of 9.3 culms per clump.

During 1993/94, when the HRMS had just started protection, a study was carried out to look at the bamboo forest conditions. While in certain cases, the new culms had lesser diameter in comparison to the older culms, the reasons attributable included poor site conditions due to soil erosion, frequent fires; improper management of bamboo clumps leading to congestion, and over-exploitation of younger culms. Records pertaining to these forest areas now under community protection revealed that these compartments had extensive fires in 1980/81 when about two-thirds of the area were burnt. Further, with little self or departmental regulation, young culms were extracted indiscriminately, which had led to the depletion of nutrient reserves affecting underground rhizome growth. Additionally, broken and cut culms were caused by wild animals like langurs and wild boar, and due to villagers cutting bamboos to make strings to tie harvested crops. The lack of cultural operations also resulted in the death and drying of bamboos.

Table 3. Responsibilities of the HRMS *vis-a-vis* the HFD for bamboo forest management

HRMS	HFD
Clearing of forests after harvest; special care to minimize the danger of fires in the JMA during the fire season (1 April to 30 June); shall assist the HFD staff in putting fires out	Ensure adequate joint management area for meeting bamboo requirement and employ only HRMS members to carry out planting and cultural operations in the joint management area
Not cut bamboos during the rainy season (July to September)	Priority to HRMS members for forestry operations during non-harvest period
Maintain the clumps in a healthy and productive state	Ensure that felling (if any) undertaken in the area by the Production Division of the HFD is restricted only to those bamboo clumps that are not required by the HRMS members
Strictly follow the felling rules	Only HRMS members are employed to do the felling
Will use the allotted bamboos only for the manufacture of bamboo articles locally and will neither re-sell nor barter the bamboos	Take necessary action against outsiders caught damaging the joint management area of the HRMS

Further, with bamboos being auctioned to contractors prior to HRMS, bamboo harvesting was conducted in a detrimental manner.

However, all this has changed tremendously in the past five years. Villagers are more conscious about the sustainability of the resource base. The first and second year culms are left untouched. The forest area is cleared of all shavings and dried bamboo to prevent fires, and when they do occur they are put off before they cause any substantial damage. The harvesting of bamboos is now undertaken by the Production Division of the HFD, which employs the *Bhanjdas* so that there is no occurrence of damage to the culms. Periodic cultural operations, restrictions on lopping of bamboo leaves, and the cutting of bamboo for strings have resulted in adequate supply of bamboos to meet the permit quotas for the *Bhanjdas* on a sustainable basis.

The Haryana JFM policy guidelines specify the roles and responsibilities of the HFD and the village societies as indicated in Table 3.

Bhabbar *grass*

Bhabbar or *sabai* (*Eulaliopsis binata*) is the most common grass in the Shivalik ranges. Because of its several uses, e.g., for manufacture of paper, in rope making, as packing material and cattle feed, *bhabbar* grass is a prime non-wood forest product in this region and has high economic value.

Of the 68 000 hectare (ha) of forest lands in the Haryana's Shivalik hills, about 20 000 ha was earlier leased out by the HFD to the paper mills for extraction of *bhabbar* grass. However, since 1980, the HFD has been holding annual open auctions for grass-cutting leases. In recent years, the HFD attempted to devise participatory management systems for reserve forest lands in the Shivalik hills, whereby, the forest communities are involved in a collaborative effort to regenerate the degraded forests by providing grass-lease opportunities as one of the economic incentives to the people. Under the JPFMP, the grass leases are sold directly to the HRMS. The forest communities, thus, get priority access to grass leases in exchange for improved protection and management of the forest area.

Bhabbar picks up growth quite early in the season whereas other fodder grasses are late starters and cannot provide appreciable forage before the end of July. The grass matures and becomes ready for harvesting as a fibre material by November. The main use of the grass is for its fibre, which is strong and can be used for making a variety of products. Also, though not an actively preferred species, it is also used as fodder in the lean season. The villagers take some cuttings of the newly sprouted young grass called *mongri* in the lean summer season and early part of the monsoon to supplement their needs for fodder for the livestock.

The first cut is usually taken by the end of June or early July when *bhabbar* begins to sprout following some pre-monsoon showers. Subsequent cuttings are taken during the monsoon months, depending upon the local condition and needs. In case of severe drought and failure of monsoon, the coarse fibrous *bhabbar* may be cut for forage as late as in September. Only the mature *bhabbar* grass harvested after October can be marketed as a fibre material. On the basis of a study conducted by the Tata Energy Research Institute (TERI) and HFD (Singh *et al.* 1993), it was impressed upon the villagers to discontinue this practice of harvesting juvenile grass as it not only reduces the annual productivity of fibre grass but also results in loss of vigour for the tufts. Now, in all HRMSs in the Shivaliks, there is a reduced incidence of harvesting juvenile *bhabbar*, resulting in increased productivity and, thus, increasing returns to each HRMS through auction of surplus *bhabbar*.

A study by TERI and the HFD shows that effective protection and management of degraded areas improves their vegetative cover due to better regeneration. There was an increase of 233.3% and 257.6% in the third and sixth year of protection, respectively, as compared to non-protection areas. This increase is attributed to the fact that the villagers not only get the fodder grass at a much cheaper rate, but they also get substantial amount of revenue by selling surplus *bhabbar* to a contractor at a higher rate due to increased production.

In addition, the JFMP has brought about changes in livestock composition—from low milk-yielding cows and goats to high-yielding buffaloes. As buffaloes are primarily stall-fed, the villagers have resorted to harvesting fodder grasses from the forests. This has helped in checking open grazing in the forest. The supply of green fodder was also augmented by the increased productivity of agricultural lands, resulting from availability of water for irrigation from the earthen water-harvesting structures constructed by the HFD.

The major systems under which *bhabbar* grass in the Morni-Pinjore and Yamunanagar forest divisions are managed, involve the HRMS, the paper mill, and the local contractors. The different systems of management that have been identified are given below.

System I: *Bhabbar* leased directly to the HRMS

There are three variants of this system.

1. The HRMS further sublets surplus *bhabbar* in an open auction.
2. *Bhabbar* is harvested by the HRMS members themselves, converted to rope and further sold in the market.
3. The HRMS manages the area leased to it on its own. Labour is employed by the HRMS to harvest the *bhabbar* and are either paid wages or are provided half the harvest *in lieu* of wages.

Bhabbar *leased directly to the HRMS, who further sublets it*

In this system, the HRMS procures the lease for the forest area from the HFD on paying the fixed royalty. This lease is further sub-contracted through an open auction, wherein, the HRMS after covering the royalty decides upon a profit margin before allotting the lease. The lessee pays for the harvesting of *bhabbar* and the transportation cost, along with meeting the protection costs during peak season. The *bhabbar* harvested is generally sold to the paper mills and a portion is sold in the open market. While this system limits the profit margin available to the HRMS, there is no uncertainty regarding income. The risk of natural factors inhibiting production and other losses are borne by the lessee. The lessee ends up with a lower margin than when the lease is taken by him from the HFD, because the lease amount payable to the Society is higher.

Bhabbar *leased directly to the HRMS, and* bhabbar *harvested by the villagers, converted to rope and further sold in the market*

This system is prevalent in HRMSs which have a majority of *Banjara* population. All the HRMS members pool their money for contributing towards the royalty to be paid to the HFD and derive *bhabbar* grass for rope-making. Members harvest *bhabbar* themselves, produce rope, and sell it in the market. The income in the families differs owing to skill in producing and marketing the rope. The price of *bhabbar* works out to be much less than the open market which helps the families earn a lot more from the same quantity of *bhabbar* procured and processed.

The HRMS manages the area leased to it on its own. Labour is employed by the HRMS to harvest the bhabbar *and are either paid wages or are provided half the harvest in lieu of wages*

The HRMS obtains the lease from the HFD on payment of royalty. When the *Banjaras* are employed by the HRMS for harvesting *bhabbar*, they are given half the produce in lieu of wages for labour. On the other hand, some HRMS obtain a lease from the HFD and undertake protection and then employ labour to harvest *bhabbar*. The HRMS pays for the transportation of the *bhabbar* harvested. The harvested *bhabbar* is sold by the HRMS to the paper mill and also in the open market. The profit margins in employing labour are higher than when the Banjaras, are employed, but the *Banjaras,* in turn, are greatly benefited and are able to derive greater incomes.

System II: *Bhabbar* leased to Ballarpur Paper Mill, which further sublets it to local contractors for harvesting purposes

The HFD leases some of its forest areas for *bhabbar* extraction to the Ballarpur Paper Mill. After paying the required royalty for each quintal of *bhabbar* harvested to the HFD, the mill often contracts the area to contractors at rates that include the costs of harvesting and transporting of *bhabbar* up to the mill site. However, apart from all these costs, the contractor also incurs costs on protection efforts. Through this method, the contractor does make a profit, but the mill also has much to gain as the cost of *bhabbar* in spite of the contracting is cheaper than the market cost.

System III: *Bhabbar* leased directly to a local contractor in an open auction who employs labour from the villages to harvest the *bhabbar* and who are either paid wages or are provided half the harvest in lieu of wages

The contractor bids for the lease of the forest area through an open auction. After obtaining the area on the payment of royalty to the HFD, the contractor employs either the *Banjaras* who are paid in kind or wage labour who are paid in cash. Either way, the contractor makes a profit. The profit is higher when he takes the lease from the HFD than from the HRMS, as the royalty payable is lower.

Comparison of the systems

The systems of management for *bhabbar* could be compared in the context of the profitability to different actors involved in the *bhabbar* leasing, harvest, and consumption.

A comparison of the different systems under which *bhabbar* is managed reveals that the profit per quintal of *bhabbar* accruing to the HRMS is more when they manage it on their own and maximum profit is earned by the HRMS when they do some secondary processing and sell the value-added product (rope). The secondary processing provides for additional employment to the villagers, and a better selling price for their product, hence a higher profit. Even when the secondary processing is not done, and *bhabbar* is managed by the HRMS itself; they make good profits. However, when the HRMS subcontracts *bhabbar,* it passes the major share of its profit to the latter. The paper mill makes a net benefit irrespective of whether it takes the *bhabbar* directly from the HFD or buys it from a contractor. This is largely because of its capacity to control prices.,

The income generated in the villages is maximum when *bhabbar* is made into rope before sale. A comparison of the prices at which HRMS buys *bhabbar* from the HFD and those at which it sells *bhabbar*-processed product in the market shows that maximum income generation, and hence employment generation, takes place in the system where *bhabbar* is processed to rope (the ratio of the two prices being 18–20 times in these cases). This higher price difference would mean that a larger amount of money remains in the village economy, either in terms of employment generated or profits earned by the HRMS. The revenue per quintal of *bhabbar* to the HFD is maximum when the area is leased to the contractor and minimum when the area is leased to an HRMS. However, a closer look at the different systems reveals that the revenue per ha, in general, is around Rs 100, irrespective of the type of lease. The revenue per quintal, where HRMS is the lessee, is less due to the higher yield per ha.

In the rules for the operationalization of the programme, it is envisaged that as a part of the JMA signed between the HFD and the HRMS, the HRMS has the first right over collection and use of *bhabbar* grass from forest areas on an annual lease basis. The lease amount payable by the HRMS to the HFD is determined through a procedure, wherein, the average price obtained in open auction for the last three years preceding JMA is treated as the base price. When such information is not available, prices are settled between the DFO and the HRMS on the advice of the state-level working group. The DFO may permit an HRMS to pay for the *bhabbar* in three installments in exceptional cases. For the existing HRMS, which dispose of surplus *bhabbar* grass after fulfilling their own requirements, there is no increase in price for subsequent years.

In case of the HRMS which use *bhabbar* harvest for *ban* making, the lease amount increases at 7.5% annually for every subsequent year. Those HRMSs which dispose of surplus *bhabbar* through an open bidding do so in a general body meeting (GBM) and in the presence of the concerned DFO or his representative. The net income made from the sale of *bhabbar* is divided between the government and the HRMS in the ratio of 1:3. The HRMS contribute 30% of its share towards the plough back fund for further improvement of the MA and another 10% towards the *Kalyan Kosh*. Other terms and conditions for the sale of *bhabbar* and grass are given in the JMA.

Timber

While the JFM policy provides for a share for the HRMS in the gross income of the HFD from the sale of forest produce, the rules provide for a share in net income. However, the rules that are under the consideration of the government, provide for the registered societies already in existence prior to the notification of these rules, as eligible for their share of income from timber from the year in which they were registered. The HRMS are to be provided a share of the HFD's income from timber, at the time of final harvest and after deducting the expenditure incurred on felling, transportation, and auction, wherein, the government gets 70% and the HRMS get 30% provided that the HRMS shall contribute 30% of its share towards the plough-back fund for further improvement of the MA and another 10% towards *Kalyan Kosh*.

Timber harvesting would, however, be guided by the provisions under the Working Plan for the forest areas under consideration for the harvest. The kind of working circle and the kind of silvicultural system that is in operation would decide the harvest levels and the returns.

Water

The importance of water-harvesting dams as a strategy in the JFMP of Haryana is paramount. As mentioned before, the programme started with the construction of soil and water conservation earthen dams in Sukhomajri providing supplemental irrigation water to agricultural land in the command of the dams. However, the manifold increase in agricultural production triggered off the participatory approach. Apart from the dams at Sukhomajri, the HFD had constructed 86 earthfill dams with a total water storage capacity of 633.64 ha-m in 52 villages at an average cost of Rs 0.35 million per dam by 1992, and these irrigated over 2854 ha of agricultural land. As of 1996/97, there are 122 dams in the area, of which, a few are undergoing repair.

Among the primary reasons for problems related to dams prior to the JFMP and TERI's involvement were faulty constructions, poor site choice, silting up of the reservoir reducing the storage capacity due to soil erosion in the catchments and clogging up of pipelines, poor distribution of water due to lack of an institutional framework/collective action for water distribution, and general negligence leading to breaking up of dams.

With TERI's involvement in the project from 1990, a major effort was made in the direction of building up the institutional structure for ensuring collective action and forging a partnership between the people and the HFD not only in the maintenance of dams after construction and water distribution, but from the very start of identification of sites for construction. A system has been evolved for:

- consultation between the HFD and villagers for site selection, construction, maintenance, and repair of dams;
- fixing and collection of water charges;
- involving all members in the protection of the catchment of the dams to prevent erosion and promote regeneration;
- leasing out the dam (in some cases) to individuals to manage and distribute water to HRMS members; and
- community involvement in minor repairs and routine maintenance of the dams, apart from the major repair works carried out by the HFD.

The landed receive water and the landless have the right to sell their share of water. While this system is in place in all societies, there are problems regarding the reach of the pipeline network, the value that the landless get for their share of water as compared with the returns the water provides to the buyer. However, a number of societies have laid out and fixed pipelines and invested time, effort, and money in repair of spillways and maintenance of dams. Further, the leasing out of the dam reservoir to fish cultivators through the monsoons till the first supplemental irrigation starts has added to the HRMS's income.

In trying to evolve a sustainable system of managing water resources, some of the issues that have been accorded high priority are listed below.

- Development of a strong institutional base and involvement of HRMS in the management of dams
- Retention of water in dams
- Equal distribution of water among members irrespective of land holdings and other socio-economic factors
- Mobilization of societies in owning responsibility for managing dams right from the construction phase
- Formation of dam committees within societies with representatives from the MC and villagers
- Motivation of societies to contribute in the form of funds and/or labour, especially for purchase and/or establishment of water conveyance system
- Discussion of dam work and estimates between HRMSs and supporting agencies and modifications wherever necessary

The revolutionary process of the system was complemented by a whole range of enabling activities to update the field staff of the HFD and educate villagers regarding the dam construction and maintenance process. This included steps ranging from the site selection to the final operationalization. This has been achieved through a set of topical and focused workshops devoted entirely to this aspect, including sessions on the study of watersheds and dam site characteristics, design of a dam and its components, maintenance of dam systems, and construction work for dam sites, followed by field demonstrations. This process has helped in empowering community members to participate in dam construction and maintenance not merely as wage labour but as enlightened partners equipped with knowledge to monitor the construction and offer constructive criticism. Their role is even more pronounced in the management of the dam water. At the same time, the HFD staff were receptive to ideas from villagers, which were incorporated in to the plans.

A large number of dams in the region became dysfunctional after breaking, essentially owing to budgetary constraints of the HFD. Though money was sanctioned for the construction of new dams, little money was available for repair and maintenance aspects. The ultimate sufferers were the villagers as the water that accumulated in the dams as run-off after monsoon rains could not be stored for long periods in broken dams. This situation was tackled in two ways. Though the HFD tried to procure more funds for repairs, the available money was made use of in an effective fashion with people's involvement. Equipment and parts required were procured through the funds and the labour was a donation from the people. In certain societies, where there was no allocation from the HFD, the HRMS contributed towards meeting the repair costs from its earnings from management and sale of fibre grass, fees collected for fodder grasses and irrigation water, and other fines and penalties imposed as part of the HRMS working.

Based on the response from the HRMS and their willingness to contribute in a substantial fashion to the dam repair work, this activity has been taken up in right earnest. This work includes minor repairs to the super structure like removal of tree growth from the dam body, repair of the spillway, and repair of the sump well inside and outside the reservoir. Also a lot of emphasis is on the realignment and laying of new pipelines to ensure greater reach of the water to the members of the Society. Pipes to pump out and divert water from non-functional and broken dams to the existing *kuhls* which are dry due to lack of water, make use of run-off accumulated in dams. This is an important attempt at maximizing benefits to the HRMS members. These works are being carried out in select HRMSs and the selection is based on certain criteria.

The identification of societies for institutional intervention for the management of water resources, especially dams, has been done looking at the nature and scale of repairs, participation and initiative of the Society members towards improved management, willingness to contribute to dam work through money (to the extent possible), societal support and labour, effect of institutional base in increasing command area, and consequently beneficiaries from the dam; and equity in the distribution of benefits.

Benefits of water management systems

With a primarily agrarian set-up of the villages in Haryana, one of the major interests of the communities is the provision of adequate irrigation facilities for enhancing the crop productivity of the fields. Water-harvesting structures have been constructed by the HFD with the primary aim of reducing soil run-off from the forest, through mechanical and vegetative measures to stabilize the catchment. The water thus collected is utilized for irrigation for the fields in the command area of the dams. The HRMS provides an important and effective management unit for the initiation of water management measures in these water scarce areas

Hence, apart from afforestation activities in the forest and common lands, the HRMS also works towards stabilization of the catchment area of the dams. A healthy and stabilized catchment ensures that there is no loss of water-holding capacity of dams due to siltation, and prevents clogging of dam outlets.

Wheat production has increased four-to-five times in response to the irrigational input. The resultant increase in agricultural residues, and growing *berseem* (green fodder) has eased the problem of fodder shortage. This has not only reduced pressure on the forest for fodder but also reduced the migration period from eight months a year to about four months. The water stored in these structures has contributed to the incomes of HRMS through pisciculture and through sale of water for irrigation to the members. The money thus generated is utilized for minor repairs and maintenance to the structure and the water distribution system.

The improved economic status of individual household due to increased agricultural production and income from livestock has resulted in the reduced dependence on forest resources. The improved economic status, predictably, has resulted in a change of the living environment in the villages with construction of *pucca* houses. This, in turn, has reduced the pressure on forests for constructional timber in the area. The fuel-use pattern of the village has also seen a shift from wood-based to fossil-based fuels, thereby, contributing towards the protection of forests.

In recent years, encouraged by the role of the existing village institutions (HRMSs), the HFD has initiated the process of undertaking plantation works in forest areas and in village common lands. The technical and financial support is provided by the HFD. The HRMS contributes by protection and management of the plantations.

In the draft Joint Forest Area rules, there is a provision for allocating and spending 30% of the HRMS's share of annual income from the sale of surplus *bhabbar, sarkanda* for afforestation and forest development activities.

The JFM initiative in Haryana shows a way to manage natural resources that is both socially acceptable and technically sound in terms of the silvicultural development practices and extraction procedures. This would ensure the stability of the productive status of the forest areas, if not enhance it. JFM has provided a forum for collective action by local village communities to enhance and regenerate the resource base (Box 3).

Box 3. Collective action by village communities; a by-product of JPFM

As summarized by Ms Lajwanti from Lohgarh HRMS, villagers have now come together not only to regulate the use of forest resource and water from the dam but also to solve various problems which the villagers faced. They have also constructed drainage channels along village roads as well as a spur for the diversion of water towards agricultural fields, from profits realized from the sale of *bhabbar* grass.

At the same time, the experience in Haryana brings to the forefront the importance of having local institutions whose interests are linked to the resource, economically or for subsistence livelihood needs. The modalities for the joint participation in the management has to be suited to the particular resource, addressing the unique needs for effective protection, conservation, and development of each resource (Box 4). The participatory evolution of these mechanisms and modalities becomes imperative for the success of the initiative. The provision of adequate legal and infrastructural support from the government department, with actual joint implementation of these agreements goes a long way in ensuring that such mechanisms become sustainable.

Box 4. A need for empowering village communities

The HRMS of Harijan Nada regulates fellings of 'subabul' from 17 ha of plantation area by charging Rs 5 per pole, from their own members and Rs 10 per pole from non-members. Mr Sarvan Kumar pointed out that they were neither able to stop outsiders from illegal felling in the plantation nor were they able to stop grazing in their forest as they had no legal powers. He requested that the HRMS should be given some formal authority to legally punish the trespassers in the forest area being protected by them.

Conclusion

The JFMP in Haryana is an attempt to improve the livelihood security of the local village communities with linkages to a sustainable, productive natural resource management system, which includes forest and agricultural lands as well. Devolving the resource management responsibility to the local village community ensures institutional sustainability through equitable sharing of benefits of forest protection.

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Institution-building Process

Introduction

There are distinct steps involved in the formation of Hill Resource Management Society (HRMS). There are a number of stages, which include the exploratory phase, site selection, consultation, microplanning, HRMS formation and registration, and then Joint Management Agreement (JMA) with the Haryana Forest Department (HFD).

Exploratory visits and preparation of range/block/beat profiles of potential Joint Forest Management areas

For initiating Joint Forest Management (JFM), the information regarding a Forest Division and its forests are essentially obtained from the respective Working Plans. In order to reach specific villages in the division, the exploration goes through the stages of the range, block, and beat following which the village is identified. In the two divisions, TERI and the HFD officials meet range wise. Officials from individual ranges along with the officials from the constituent blocks and beats take part in these meetings. Most of the discussions are held using maps of the blocks and beats to keep the discussions/probes more focused. Information regarding the forests, other features like the natural streams, agricultural land, potential dam sites, plantation areas, etc., are explored and marked.

Following this, is the visit to certain villages with the respective block and beat officers. Informal discussions are held with the villagers which help in understanding details regarding the population, the caste structure, occupational patterns, forest use, etc. This helps in comprehension of the overall situation in the village including the major problems being faced and the opportunities for finding solutions. Data schedules are then filled up containing issues that relate to Joint Forest Management Programme (JFMP). Maps and meetings are essentially used as diagnostic tools and interactive techniques. Information obtained at the village level is compiled to provide a picture of the blocks and then of the range. This was the procedure followed for the preparation of range profiles for all the ranges in the Morni-Pinjore Forest Division.

Microplanning

It is now broadly accepted that the local people have a genuine stake in the health of the local resources. They must effectively participate in the planning and implementation of the development process. This would require suitable initiative to develop land-use planning capability at the grass-roots level, both for the village communities as well as the field staff of the Forest Department (FD). Preparation of village-level action plans through participatory microplanning, therefore, has a pivotal role in the sustainable management of resources.

The linkage of the resource management of a specific area with an identifiable user-group/community is established, and this is affected through a number of periodic consultations. The attempt is to transfer the confidence that the HFD and the Tata Energy Research Institute (TERI) have in people's abilities to manage and control the forest resources. Under the guidance of the HFD, the forest users have become directly involved in the forest management decision-making process. Technical advice and financial assistance is from the HFD. The process of microplanning has proved useful in motivating, organizing, and involving village communities in the protection, regeneration, and development of degraded forest areas in the Haryana Shivaliks. The importance of microplan is in the initiation of the programme. It provides an opportunity to understand the usage of forest products and the level of dependence of people on forests. Apart from assessing the resource condition, the process is helpful in understanding the problems and constraints in the context of the forests. Often, priorities are ascertained based on social and ecological considerations and the requisite inputs determined.

An important prerequisite before initiating the process is the collection of relevant information in the context of the site/village that has been identified for initiating JFM. The information includes existing acts and laws, government reports, gazettes, and notifications, regarding land settlement and tenure systems; the laws, rights, and privileges applicable to individuals, etc. Topographic maps are important for planning, and a great deal of this is done using the survey sheets of the HFD which have a scale of 1:15 000. Among the important outputs of the exercise which constitute the village profile are:

- village community composition and economic focus;
- resource holdings including land, livestock, and machinery;
- biomass requirements, expectations, and shortfalls;
- villagers' view of forest resources;
- traditional rights and tenure patterns in the forests;
- conflicts related to forest use;
- forest degradation problems;
- villagers' role in controlling degradation process; and
- FD inputs expected by the villagers.

Participatory Rural Appraisal (PRA) has been extensively used for eliciting information on the Haryana JFMP. PRA's role has been in facilitating interaction and understanding between the FD staff, TERI team, and the villagers. A number of methods have been used which include mapping—social and resource, where the use, vegetation, erosion status, and the condition of the resource are mapped; transects; trend-lines; seasonal calendars; ranking and scoring; etc.

Factors influencing site selection for initiating JFM

While a number of sites are studied in the process of programme initiation, there are certain key factors that influence the selection of particular villages/hamlets for actually implementing the programme. These factors could broadly be categorized into those dealing with the socio-economic composition of the village, forest status, institutional capacity, possibility of agreements, etc.

Socio-economic composition

Villages that exhibit a relative homogeneity of caste and economic status have provided the HFD and TERI an easier access for interaction with villagers. A higher degree of dependence on forest resources, and the sense of scarcity owing to degradation and depletion in availability of forest produce is seen to propel the villagers to take up protection and management with lesser conviction than those who continue to perceive the resource to be abundant. The need to protection is directly influenced by the perceived end result. The communities expect greater returns from the forests as a consequence of the protection they have offered and the regulations imposed/restraint shown in resource utilization. Greater economic returns for protection has proved to be an important element in the Haryana JFMP.

It is interesting to note that the returns to the communities in Haryana are indirect. The increase in milk production with improvement in productivity of current livestock holdings or due to changes effected in the quality of livestock, all owing to the increased availability of fodder grass from the protected forests; and increase in agricultural yields owing to the supplemental irrigation provided by the dam water are instances of economic returns. However, the profits made by the HRMSs with the management and sale of *bhabbar* form a part of the society fund which is used for creating infrastructure, etc., for use by all villagers, and, thus, has no direct economic benefit for the villagers.

While all adults from all households in the village are eligible for membership of the HRMS, the success of the HRMS is very much dependent upon the interaction that these members have with the forests. The sense of ownership and belonging they have for the forests is very closely linked with the dependence and use of the forests for the people. This is one of the reasons why the membership of the HRMSs has not been extended to families that are not resident in the villages or do not procure any produce from the forests.

Forest status

While JFM activities are restricted to degraded forest areas, it is essential that these areas have excellent regeneration potential and are able to provide some forest produce in a short duration of time to capture people's interest and involvement. Tree growth is normally time consuming and is also dependent upon the root stock available. The availability of produce that can be accessed by all villagers and could be shared equitably on the evolution/designing of a system for its distribution is very crucial. All this essentially means that a direct linkage is established between access to resources and improvement of degraded lands. While forest produce is available to the people, over the years, tree growth also picks up. A clear understanding regarding the benefit distribution in the case of trees is important. This encourages people to provide adequate protection to these trees and prevent any kind of unintentional damage.

Institution

The existence and functioning of other village institutions is an important indicator of the success possibilities for the HRMS. Many such institutions are created by different government agencies for implementing different programmes, but in most of the cases, the entire village is not represented, and only those families who are beneficiaries of the specific programmes are members. Further, men and women are rarely members of the same institutions. Another very important indicator from the point of view of universal membership, and equity of access and use that the HRMS seeks to promote is very much dependent on the general social structure of the village. A favourable interaction existing between the different castes facilitates the initiation and implementation of the programme.

Agreements

One very important factor that facilitates the project's implementation is the framing of an agreement between the HRMS and the FD for Forest Management. The agreement based on clear and enforceable demarcation of forest area to be protected and managed, and the rights and responsibilities of all parties involved is crucial. Further, as mentioned before, the sharing of benefits between the HRMS and the FD should be linked to the protection of forests. The partnership based on such clear thinking and understanding has spelt success for the programme in Haryana.

Forest department

The experimentation with JFM in Haryana began much before the JFM resolution by the Government of India. This reflects the FD's sensitivity to people's needs, and provides evidence of the attitude of the FD and their readiness to take villagers as partners in the process of forest protection and management. It has not been possible to maintain continuity of forest staff, especially those deployed in the field such as Forest Guards and Foresters. However, the experience from the field reveals the need and importance of staff continuity. Through the Joint Management Units (JMUs), the HFD was in regular touch with people at grass-roots level. Village meetings are always attended by the respective field functionaries, and there are many instances when the Divisional Forest Officer (Territorial) [DFO (T)] of the Morni-Pinjore Forest Division has attended meetings to understand people's view point, and provide suggestions and solutions.

Another very important contribution from the FD is its role in the enactment of a clear policy and the attendant rules for JFM. While the policy in Haryana came out in June 1990 itself, the rules have been finalized and have been submitted to the government for approval. The policy and rules while providing the necessary legal backing to the programme, also facilitate the implementation process. The institutionalization of the JFM programme in the working of the HFD is further facilitated by these rules and policies.

NGOs/voluntary organizations

There are many advantages to the presence of a non-governmental organization (NGO) in the programme area as is reflected by TERI's experience, and many such instances from other states where JFM is being implemented. Ensuring involvement of people from all sections of the village society and facilitating equity in their access to and use of forest produce is an important contribution of NGOs. NGOs with their commitment to equity and social justice prove effective in this process. NGOs with forestry and technical skills are a great asset for JFMP as they are in a position to comprehend the working of the FD, and are able to involve the HRMSs in the monitoring and evaluation of the forest resource rejuvenation after protection.

The TERI resource team comprises professionals with multidisciplinary backgrounds involving academic and professional exposure to diverse areas of forestry, rural sociology, common property resources, participatory management, natural resource management, and extension and wasteland development. The greatest strength of the resource team lies in its ability and determination to establish credible rapport with the local communities and work with them.

Another very important factor that defines the success of JFM is the area-based approach and the presence of the NGO. The constant presence of TERI has helped in effectively bridging the gap between the people and the HFD. Further, the facilitator's role played by TERI during meetings and interactions helps in the creation of a conducive atmosphere for effective communication between the HFD and the HRMS, and to understand each other's requirements, problems, and seek solutions and prompt redressal.

Incentives

Incentives for forest protection and management form a crucial basis for HRMS formation under the JFM. One or more of the following incentives are provided to societies in Haryana to provide the HRMS a stake in improved management and production of forest areas.

- *Water (through a dam or a* kuhl *system).* Water is provided to villagers for irrigating their agricultural lands and to reduce their dependence on the forest area in lieu of their stopping open grazing to protect their water source.
- *Grass for fodder.* The HRMS is given lease of forest area for hand harvesting of fodder grass instead of auctioning it to intermediary contractors. In exchange, the HRMS protects the forest area from open grazing.
- Bhabbar *for rope-making or sale.* The HRMSs are provided a lease (instead of either auctioning to private contractors or a lease direct to the paper mill) for harvest of *bhabbar* grass. In villages where the *Banjaras* use *bhabbar* for rope-making, a provision is incorporated in the agreement with HRMS that all their *bhabbar* requirements will be met prior to sale of the grass to outsiders.
- *Bamboos for basket-making.* Members of *Bhanjda* community engaged in bamboo basket-making are provided permits by the HFD for harvesting 100 bamboos for nine months in the year (mid September to mid June), on the payment of Rs 7 on the condition that they will maintain the clumps at optimum productivity levels, and assist in prevention of fire during the season. They can also be asked to harvest bamboo for the production division to ensure that there is no mishandling of clumps by outside labour.
- *Timber, katha, firewood, fruit, and other forest produce.* There is provision for working out similar arrangements for harvesting/processing other products. (For details, see the next chapter.)

The above discussion details some of the important factors that have influenced site selection in the JFM programme in Haryana. However, the villagers have not always waited for initiatives by the HFD and TERI in HRMS formation. Also HRMSs in some villages were formed for managing certain specific incentives; however, with time, the number of incentives increased or ceased.

It is well recorded that participatory management was initiated in Sukhomajri and Nada. There was a remarkable demonstration effect of these experiments which resulted in many villages taking up such activities. Requests were brought to the HFD and TERI for helping with the actual paperwork and other formalities after the villagers had decided to become part of the process. It is to the credit of TERI and the HFD, that HRMSs formed by them and those forged by the individual villages are equally successful.

Society formation

A very important step in the effective protection and management of forests, and the implementation of JFM is the organization of the villagers into a society. Following the initial profile preparation, and the microplanning process which helps in gaining a full understanding of the village, its requirements, the problems and the attitudes, and after ascertaining the preparedness of the village to become partners in the process, the process of society formation is initiated.

Discussion with the villagers

The JFMP in its entirety is explained to the villagers in a meeting of the entire village. The process of society formation, the management options, the partnership with the HFD are all explained yet again. Based on the information already collected, the case for society formation and partnership is put forward. The dependency of the village on the forests, the forest produce extracted, the other income options, the traditional uses and rights of the villagers in the forest areas are all discussed. A final shape is given to the socio-economic data of the village. The forest resource maps used in the microplanning and the results obtained are presented to the people.

Formation of a society

When a consensus is recorded for society formation, the villagers are encouraged to form the society. TERI and the HFD staff guide the process, and some of the factors that are ensured include:

- incentives to be offered by the HFD like fodder and *bhabbar* grass lease or dam water or bamboos, etc.;
- the composition of the society, as far as possible, is restricted to the recognized revenue record boundaries, which helps in the smooth functioning of the society;
- all adults from the village, both men and women, are members, and at least one man and one woman from each village are members of the society;
- the management committee (MC) has at least 7 to 11 members and their representation is across all sections of the society, and there are a minimum of two women in the MC, or one-third where the MC is large;
- that the MC would meet at least four times in an year and would be reconstituted every year;
- that the General Body (GB) meets at least three-to-four times every year;
- that a bank account is opened in the name of the HRMS which is to be audited every year, and all transactions to be presented to the GB;
- the society is to be registered with the Registrar of Societies under the Societies Registration Act, 1864; and
- for the registration, the society would ensure the signatures of the members on the form and submit the same to the JMU office for further action. The by-laws for the society would also be attached.

Among the important documents that would be in the possession of the HRMS and updated and maintained by them are a copy of the by-laws, constitution and registration certificate of the HRMS; a copy of the JMA signed by the HRMS and the HFD; membership register, minutes register, water-use register, fodder and fuel-use register; cash book, receipt book, bank accounts record; audit and annual report of the society.

Responsibilities of members

The society building and sustenance process is greatly dependent upon the roles and responsibilities that the MC and the GB members undertake. Regular meetings, optimum attendance, maintenance of records, transparency of operations and transactions, accountability, all contribute to the institution-building process. Table 1 details the responsibilities of the HRMS members in their different capacities.

Joint Management Agreement

Following the society formation process and the completion of paper work, the HFD and the villagers, with the help of the forest area map, work out the modalities of the forest area management. The villages involved, the leases that would be provided like *bhabbar* grass and fodder grass, water from dams and *kuhls*, etc., are some of the issues that are finalized. Following this, the plan for forest protection and management is prepared and agreed upon. The options for forest protection are explored and a watchman is appointed, wherever necessary. Dispute arbitration and conflict resolution mechanisms are worked out.

Among the significant cornerstones of the partnership between the HFD and the HRMS are mutual acceptance of clearly-defined rights, responsibilities, and accountability. This has essentially led to a shift from centralized, top-down planning and authority to the development of a capacity for decentralized decision-making, responsive to the diversity of local needs and priorities; a planning process that is flexible and sensitive. The HFD has played an additional role of guiding and nurturing the development of strong, sustainable, and autonomous local institutions. On the other hand, the HRMS has risen above individual interests and contributed to the development and strengthening of their own institutional capacity, to sustainably manage forest resources on transparent principles of equity and accountability. This is a departure from the generally inadequate performance of government-sponsored local institutions in India, largely due to their not being founded on sound participatory and democratic principles.

The significant features of the JMA between the HRMS and the HFD are described below:

- The JMA defines the basis of JFM between each HRMS and the HFD;
- On behalf of the HRMS, a JMA is signed by two or more of its elected MC members authorized for the purpose;
- On behalf of the Government of Haryana, the concerned Divisional Forest Officer signs the JMA;

Table 1. Responsibilities of members of the MC, GB, and office-bearers

MC members	Office-bearers	GB
Participate in the monthly meetings of the MC	The President presides over all meetings of the HRMS and is a signatory to all legal and business documents.	Participate in all GB meetings and provide suggestions/thoughts at these meetings.
Convene at least three meetings of the GB, where the members are appraised of the working of the MC, other significant developments, accounts update, and initiate discussions on future programmes.	The Secretary is responsible for convening meetings and maintenance of the meeting minutes. The Secretary also provides the annual report of the HRMS functioning to be presented at election meetings.	The GB must elect members who can bear the responsibilities of the HRMS and those who will encourage the participation of all members in the functioning of the HRMS.
Seek approval of the GB on major issues like *bhabbar* lease contracts, other expenditures, etc.	The Cashier is responsible for maintenance of accounts of the HRMS and clarifies issues regarding financial transactions of the HRMS to members. All members who deposit money with the Secretary are issued receipts. The Secretary also provides the income-expenditure statement at the annual election meeting of the HRMS.	Make payments in accordance with the rates fixed by the society for grass, water, bamboos, etc., whichever is applicable.
To inform the Forest Guard and the Forester about the HRMS meetings and ensure their presence.	The other members of the MC are expected to attend all meetings and support the President and the Secretary in undertaking their duties.	Will obtain receipts for all payments made to the HRMS.

- Each JMA specifies the following:
  a. A clearly delineated forest area (to be shown on a map with its area in hectares and its existing condition) as the Management Area (MA) to be jointly managed by the HFD and the concerned HRMS.
  b. Management Plan for the MA shall be evolved for sharing timber in consultation with the concerned HRMS. For sharing water, fodder grasses, *bhabbar*, bamboo, or any other forest produce which has a rotation period of less than five years, preparation of management plan is optional.

c. The rights and responsibilities of both parties including benefit-sharing is in accordance with the norms outlined in JMA.

The institution-building process

Since the inception of the JFMP in July 1990, emphasis has remained on design, development, and implementation of appropriate strategies and mechanisms which address the broader agenda of community participation and integration of JFM in departmental functioning. The underlying approach in selecting the strategies/mechanisms is guided by joint involvement of both communities and the FD in the collective endeavour of developing sustainable forest management systems.

The inherent strength and enterprise of the HRMS is a decisive factor affecting the joint functioning of societies and the HFD alike. The partnership between the HRMS and the HFD is being strengthened by wider representation and participation in societal functions, equitable benefit-sharing, and conflict resolution. Institution development activities include village meetings, resolution of conflicts, holding of elections, enhancing institutional support programmes, training workshops, farmers training camps, and women's training workshops.

Village meetings

Village meetings are the platforms for discussion of issues like membership, women's involvement, representativeness of the MC, role of office-bearers, HRMS records, account keeping, utilization of funds, elections, meetings, decision-making, conflict resolution, benefit distribution, *bhabbar*/fodder grass management, dams, etc. The emphasis on sustained institutional development and systematic assimilation of JFMP would continue to guide the approach of the team. Formal and informal meetings of the JMU and the field staff of the HFD, and TERI resource team with various village communities, HRMS members, MC members, and women are an important component in institution building. Similar meetings are also held with the executive staff of the HFD.

The societies in Morni-Pinjore and Yamunanagar Forest Divisions were regularly visited by TERI resource team with a view to facilitate and motivate the HRMS in undertaking collective action on emerging issues. With the passage of time, more and more HRMSs have shown initiative and imagination in managing the affairs of their societies, and in undertaking plantation work, dam maintenance and repairs, and management of grass leases. Utilization of funds, demarcation of forest resources, and grass leases are issues that are dealt with frequently. Wherever boundaries between adjacent societies are not clearly demarcated on the ground, causing conflict for management of *bhabbar* lease, the resource team has been striving to reconcile the issue in consultation with the HFD, the HRMS members, and villagers.

Conflict resolution

Conflicts are a natural outcome of the functioning of the societies in the different villages. There are many reasons for these, including villages other than those already part of the existent society staking claims over the forests and produce, issues arising out of deliberations of existing societies in terms of use of funds, distribution of resources, and benefits, etc. TERI and the HFD have been playing an active role in this process of dispute arbitration and conflict resolution. This issue has been dealt with at great detail separately in the book.

Election meeting

Election meetings which are convened for electing a new MC involve updating and review of society records on membership, resolution, *dati*, water charges, income, and expenses. The new office-bearers are elected after clarification of past activities and records in GB meetings. The practice of undertaking informal participatory exercises on records and accounts has made a positive impact on wider involvement of communities. Election meetings are also utilized for increasing the representation of hitherto marginalized sections and women of the village, whose membership has increased in most societies during the election process. Involvement of the HFD field staff and women is emphasized by ensuring their presence, and inclusion of women in the MC through popular mandate.

Training programmes

Training is a crucial component in the institution-building process. Training programmes on different institutional aspects of JFM are conducted regularly for forest guards (FGs) and block officers (BOs) of HFD, office-bearers of the HRMS, GB members, and women are being conducted. Separate training workshops for the HFD and village communities on baseline vegetation survey, microplanning, and repair and maintenance of dams have also been organized. Syllabi for all these training programmes have been prepared by TERI with the help of HFD. These workshops, include both classroom sessions and field exercises, and facilitate exchange of views among participants on different aspects of the programme.

HRMS

Training of MC members

These programmes focus on orienting participants to the nature of JFM practices and the extent of dependence of local communities on neighbouring forests. Lectures on account keeping, maintenance and management of dams, management of grass and *bhabbar* leases, bamboos, and plantation activities undertaken by the HRMS are discussed. Problems specific to the village, like condition of the dam, grazing activities in the catchment, and amount of lease money to be deposited with the HRMS by members are also taken up for discussion.

Training of office-bearers

To build up the capabilities and understanding of village communities and for ensuring effective participation in implementing the JFMP, these trainings are held for the office-bearers of the HRMS. The duration of these camps is two days during which salient features of the JFMP, emerging problems, and their possible solutions are discussed through participatory dialogue. Such training programmes also help in resolving conflicts among different user groups and for evolving suitable strategies for efficient functioning of the HRMS.

Training of farmers

These training programmes focus on the concepts and prospects for JFM. Issues like membership of the HRMS, maintenance of records, and repair of water-harvesting dams are discussed. The local FG is invited for these workshops in the presence of whom village-specific issues like water rates, livestock grazing, and women's participation, among others, are discussed. In some cases, a visit to the water-harvesting dam in the vicinity of the village is also undertaken.

Training of women

These camps facilitate discussions among women members of the HRMS, TERI resource team and the HFD on issues relating to women's participation in the process of decision-making relating to resource use and forest protection. These trainings consist of informal and unstructured discussions with women of the village. Broad issues like role of the HRMS, nature of HRMS membership, and women's' participation are discussed. Consequently, factors inhibiting effective women's' participation in village meetings, cattle and fuelwood related problems are also taken up for discussion.

HFD

Training of field staff

These workshops serve to orient the field staff of the HFD (FG and BO) to the objectives and policy of JFM. Classroom sessions help to explain the concept and strategies of the programme, communication and PRA techniques, process of the HRMS formation, microplanning, and process of monitoring and evaluation. Subsequently, specific problems faced by the field staff in the process of implementing JFMP are taken up for discussion. Among the issues discussed are peoples' participation in plantation activity, criteria for selection of site for construction of water-harvesting dams, and modalities of benefit-sharing.

Baseline survey training

These workshops focus on imparting field-based skills on methods of baseline vegetation survey of forest resources. Classroom sessions on baseline survey methods are followed by field exercises during which trainees and TERI resource team conduct baseline survey exercises. Field exercises are followed by a day-to-day synthesis, report writing, presentation of group exercises, and discussions. Participants are exposed to parameters like profile of quadrants, girth class distribution, and biomass yield. Specific queries relating to impact of grazing on the extent of ground cover and parameters of baseline vegetation survey are clarified.

Senior officers' training

In this workshop, policy level issues relating to implementation of JFMP are deliberated. Among the issues focused upon are:

- the role of the Working Group (WG) and how to make them more effective;
- the importance of process documentation being currently done under the programme, and dissemination of this information along with sharing of similar experiences from other parts of the country;
- the importance of the role of women in the JFM, and the need for taking serious and effective steps to ensure their meaningful participation in the programme;
- the urgent need for developing microplans for each HRMS as a tool for resource planning in an effort to ensure sustainability of the programme;
- the benefits accruing from training workshops being conducted for the HFD staff/officers and HRMS members, the need for continuing these in future with necessary modifications for increasing effectiveness, and assisting the target groups in playing their role in JFMP; and
- the process of institution-building, through meetings, trainings, interaction, etc., for creating self-reliant, village-level institutions in the form of the HRMS.

HFD and HRMS

Training on construction, maintenance, and repair of water-harvesting dams are organized for the staff of the HFD as well as representatives of various HRMS. One-day classroom sessions and two days of field visits to dam sites are organized. The classroom sessions cover issues like selection criteria of dam site, design of water-harvesting structures and their construction, location of spillway, and management of water resources. During visits to dam sites, participants are encouraged to share their experiences with management and maintenance of water-harvesting dams. Specific queries relating to location of spillway, rehabilitation of catchment area, preparation of estimates for repairs, and irrigation potential of the dams are clarified by the resource team consisting of experts drawn from the Central Soil and Water Conservation Research and Training Institute and TERI.

Thus, the process of society formation goes through various stages. First, an exploration of the possible JFM sites in the identified forest division, down to its smallest administrative unit, the beat, is conducted. Then, microplanning exercise provides us the inputs for designing incentives for encouraging people's participation along with the appropriateness of the site for JFM. This is followed by the actual society formation process and the signing of the JMA. This institution-building exercise is an ongoing process, and the greater the interest evinced by the villagers and the HFD, the faster is the process, and stronger the institution. Frequent meetings, conflict resolution mechanisms, greater accountability of all members, free and fair elections, capacity-building exercises, all contribute to the institution-building process.

The Hill Resource Management Society: a People's Institution

Introduction

Under Joint Forest Management (JFM), it became evident that there was a need to develop a people's institution, other than the existing *Gram Panchayats*, which are state-sponsored village-level bodies for self governance. These people's institutions, it was envisaged, would promote the equitable representation across all sections of the village in the JFM process. The track record of *Gram Panchayat* has indicated that this institution has somehow failed to provide equal opportunities to villages and communities which were socially, culturally, and economically diverse. *Gram Panchayats* are institutions in which government control persists in terms of finances and resource management powers, such that the legitimacy of local leadership and traditions of collective decision-making are not in place. Moreover, as a state-regulated structure, the *Panchayat* is not necessarily sensitive to the essential needs of the local village people.

The realization that there was a need for the existence and functioning of village community-level institutions, especially for the protection and management of the degraded Shivalik foothills, prompted the Haryana Forest Department (HFD), the Centre for Soil and Water Conservation Research and Training Institute (CSWCRTI), and later the Tata Energy Research Institute (TERI) to create such an institution, now known as the Hill Resource Management Society (HRMS).

The HRMSs were viewed as effective decentralized management systems, which consider dependency, scarcity, residency, rights, and traditions in evolving equitable agreements among different forest-related users and communities. The founding principles of HRMS are appropriate social composition, organizational norms, accountability, conflict arbitration, and autonomy, all of which are crucial for the survival of village institutions. Clearly-defined rights, responsibilities, and accountability of the Forest Department (FD) and the HRMS as a whole, and each member, are the cornerstones of this institution.

The previous chapter delineated the different steps involved in the institution-building process. This chapter dwells on the management and functioning of these institutions—the HRMSs. The HRMSs reflect the efficacy of the long-felt need for smaller groups of resource-dependent users to assume an active, primary role in local forest management. The Joint Management Agreements (JMAs) between the HFD and the HRMS are formed on the basis of trust, dialogue, and mutually-defined rights and responsibilities of both parties. The inherent strength and enterprise of the HRMS is a decisive factor in bringing the village communities and the HFD together in a partnership mode to collectively protect and manage forests.

Transition

As mentioned in earlier chapters, the experiment at Sukhomajri resulted in the creation of the first Water-Users' Association (WUA). By the time, the Joint Forest Management Programme (JFMP) came into being, following the Haryana Government Order, a number of soil conservation and water-harvesting structures had been constructed in the foothills of the Shivaliks in a number of locations by the HFD. Along with other check dams, trenches, etc., these dams were constructed at regular intervals. For the distribution of water that accumulated in the reservoirs of these dams, WUAs were formed. The details are provided in the earlier chapters.

With the launching of the JFMP and the drafting of the provisions under the JMA, as part of the policy, the need for creating institutions to take the programme forward arose. However, the inherent iniquitous nature of the Haryana rural society prompted the HFD to create an institution at the village level for forest management, separate from the *Panchayat.*

Constitution of the HRMS

The process for the constitution of the HRMS is provided for in the JMA rules. An HRMS is constituted when all adult men and women, from all households, who are residents of a hamlet, a village, or a group of villages (which may or may not coincide with a revenue village or a *Gram Panchayat*), and which is/are located within or near forest areas, become members. In Haryana, women's traditional socio-economic status is among the lowest in the country. But irrespective of religion or caste, few village men have questioned the Forest Department's (FD's) insistence on treating women as equal and independent members in the HRMS, as a precondition to finalizing a joint partnership agreement.

These HRMS members enjoy usufruct rights in the forest area demarcated for protection and management by the HRMS as per the last forest or revenue settlement. Those who have been traditionally collecting/using forest produce for their livelihood or subsistence needs constitute the General Body (GB) of the HRMS. In cases where there have been settlers from other areas, such as villages like Suratpur or Rajjipur where workers at the ACC factory have settled, this issue of settlers and membership to them was solved by opening membership to those persons actually involved in the collection of the forest produce.

While the membership for the HRMS needs to come from all sections of the village, and all men and women, mere provisions in rules and by-laws have been found to be grossly inadequate to change practices and mindsets in a hitherto iniquitous society. The HFD officials are ex-officio members of the Society. The main role of the HFD and TERI has been in facilitating the involvement and membership of women across all socio-economic strata, and men from the weaker sections, and providing them a genuine opportunity to influence choices. This is a welcome reflection of the sensitivity of the FD towards the importance of empowering the traditionally weaker sub-groups to articulate their priorities.

Helping the villagers break down their traditional barriers has been a significant breakthrough in the entire process. There are HRMSs where communities like the *Bhanjadas* (bamboo basket-makers) and the *Banjaras* (*bhabbar* rope-makers), who depend on forests for their livelihood and are at the lower rung of the social ladder, have taken up greater responsibilities of forest protection and regulation of resource use, with rest of the village abiding by the agreements. This is also the case where an incentive of non-timber forest product (NTFP) has proved to be especially significant, where there is primary subsistence or economic forest dependence, and these communities have come forward to protect the forests because of the threat to the resource.

While residents of the villages were eligible for membership, a conscious decision of extending membership only to permanent residents of the villages next to the forest was taken to allow local residents to have full control over the forests. Those who could not be directly involved or participate in the routine activities of forest protection owing to their long absence from the village were excluded. The expansion of the programme has seen several issues emerging regarding membership eligibility. Traditional use rights, prior agreements with the FD and other government departments, and usufructuary rights were some of the grounds put forward for inclusion in the HRMS. Many of the issues related to formal and informal rights and resource dependencies have been determined and resolved using participatory methods and consensus. Thus, attempts have been made to enable the needy and the dependent to access forest resources while adhering to the provisions for HRMS formation. Thus, secondary user's rights are recognized so as to prevent inequitable exclusion of periodic benefits to the more distant secondary users, while formalizing access rules and clarifying user rights. These issues have been discussed in detail below.

Primary membership

Among the important factors that have determined membership have been dependency, sense of scarcity, residency, rights, and traditions. Permanent residence was essential for membership, since active participation was perceived to flow from proximity to the resource and its problems. The membership in the GB of all programme villages is across all castes and classes in the village, and women and men have equal rights for membership. Voluntary, open membership to all residents, equal and independent eligibility for women, and the option for inclusion of new settlers (whose dependence levels are high), are cornerstones of the HRMS. At the same time, this has been followed up by ensuring that all those eligible are aware of their right to join, and there is greater encouragement for the underprivileged and women to become part of the process.

A difference is observed in villages, where particular castes like *Bhanjadas* and *Banjaras*, who are dependent on forests for their livelihood, form the HRMS, while villagers belonging to the other castes are not part of the societies. The incentives of non-wood forest products (NWFP) in the form of bamboos and *bhabbar* are significant for these communities, especially when they are heavily dependent on the forests for their primary subsistence as well as for economic reasons.

The HRMS has the responsibility of protecting forest resources and the authority to regulate forest use. These societies have seen a greater participation of women who are primarily engaged in basket- and rope-making, which provide them income. Membership earlier was limited to one adult male and female from each household. However, this has been changed to all adults in a village. To ensure involvement of women in the decision-making process, the election of two-to-three women to the Management Committee (MC) has been made compulsory.

Management Committee

The GB delegates powers of day-to-day decision-making to the MC, which is made up of elected/selected office-bearers who are supported by non-office-bearing representatives. This selection is through a transparent process facilitated by the HFD and TERI. Their presence further provides an opportunity for the weaker sections to articulate their options/choices. What is true for the GB holds true for the MC. While minorities and women are selected/elected to the MC for mandatory and other reasons, the powerful and influential do tend to dominate the proceedings. Though the need for equal representation across gender and socio-economic groups is emphasized, a conscious gender representation has led to a prescribed numeric representation of two or more women members in all MCs. The MC is constituted of seven-to-nine members, including at least two women and one representative of economically backward classes, scheduled castes, and scheduled tribes.

This greater spread of the MC membership has been seen to have the potential to prevent politics, and only one member from a family is allowed to be a member of the MC. However, where women are actively involved in the collection, use, or processing of forest produce, their representation is proportionately higher, which results in there being more women than men in the MC like in Bargodam and Kalka HRMSs where women have a major role in processing bamboo into baskets.

This situation has undergone a sea change owing to the empowerment process that has been set forth, and it is now not uncommon for more than two women to be in the MC, and women to be presidents of HRMSs. The same is true for the members from the lower castes.

An important supporting pillar for the HRMS is the accountability of the MC. This accountability is essential for the decision-making mechanism, and has been facilitated by greater and regular consultation with the GB to lead to an accountable decision-making mechanism. While the MC may make certain types of decisions on behalf of the HRMS, most major decisions are ratified by the GB before they are finalized and implemented. For this, a quarterly meeting of the GB is ensured in order for the MC to inform members about its activities during the intervening period, present income and expenditure statements, seek approval for expenditures beyond Rs 500, and approval for future activities. Further, where the system is perceived to be iquitable and operating smoothly, the MC gains legitimacy and the respect and support of the community.

Accountability of the leadership is by both locally and centrally-determined (HFD/TERI) norms and standards. Its effective enforcement in Haryana is essentially due to an open management style in which all members have access to community activities and records. Effective management has been facilitated by training programmes conducted for every set of office-bearers and the GB. This has equipped them to review and understand information. At the same time, a process for facilitating local involvement in the JFMP decisions and actions has been set in place.

Over the years as a consequence of a great deal of discussions and experiences, a consensus on the roles and responsibilities of the members of the MC has been agreed upon. Accordingly, many trainings have been organized to equip office-bearers to fulfils their duties to the HRMS. A very important component of these training programmes is leadership development, as leaders facilitate in helping the community reach a consensus regarding management decisions. A clear definition of rules and responsibilities of all members of the Society and the MC has helped in the smooth functioning of HRMSs.

Meetings

The meetings of the HRMS are convened by the Secretary while the President presides over them. The Forest Guard (FG) from the HFD, who is in charge of the forest area that is being managed by the HRMS, is often present and the Block Officer and the Range Officer are known to attend some of the meetings and all elections. Now the announcement for meetings is made in written, wherein a register is circulated by the Secretary among all the HRMS members, and the meeting is convened only after a majority confirm participation. Meetings are scheduled at venues which are accessible to all members.

Over the years, the observation is that despite the best efforts of the HRMS members, the social hierarchy of villages does get reflected in these meetings. The consequent effect is that minorities and women tend to get overshadowed. However, the presence of facilitators in the form of the HFD officials or the TERI team prevents such an occurrence; more importantly, they ensure maximum attendance of members across all sections of the village. While the caste system of centuries is quite deeply ingrained in the Society, the change in mindsets has been significant during the programme period.

The HRMS members meet regularly to transact routine and important business. The attendance in these meetings has improved over the years. This has been largely brought about by learning from the past experience which factors are likely to play an important role in ensuring more broad-based participation. For example, now meetings are scheduled at a time convenient for all members, and are avoided at meal times and such times, which are inconvenient for women with children to look after. In the beginning, the concerned FG always relied on the MC members to inform all the other members of the HRMS. However, in this process, women from upper castes and both men and women from the lower/minority castes were rarely informed, which resulted in thin attendance in meetings. Consequently, few members identified with the decisions taken in the meetings and this resulted in conflicts.

Among the important points of discussion in these meetings is the issue of caste status. This caste status often relates to the socio-economic status of the members of the HRMS. This is a sensitive issue and has been tackled very deftly in all HRMSs. Concessions to families have been worked out in the HRMS, as families from the lower castes are landless and have greater dependency on forests. Owing to their inability to pay high *dati* rates, there is consensus on their paying lower rates. Issues of burgeoning populations and the resultant pressure on the forests and the need for control measures are often discussed. The need for educating children is also discussed, and a school has been commissioned in Uttamwala village on the initiative of the villagers. Issues of general health and hygiene are frequently emphasized.

The role of the HFD and TERI has been significant in removing the taboo attached to discussing these so-called sensitive issues. Their ability to create an open atmosphere, free of any malice or ill intent, where people from all sections are able to voice opinions/views/feelings in an open fashion, is critical for the programme. It is the creation of such fora that has enabled members to break the most prohibitive barrier of caste and arrive at decisions that apply equally to all. The dominant castes have been sensitized to empathise with the needs of other sections of the villages whether they are in a minority or majority. This has resulted in the involvement of the entire village in stages ranging from planning, wherein needs and dependencies are assessed, through to implementation. This participatory decision-making process has proven to be a boon to the poorer or disadvantaged sections who are as much as valued partners in the process as others. With their needs being met through the programme, their participation is crucial.

Decision-making

The decision-making in the HRMS can be broadly divided into two sets, routine and major. Among the routine decisions are the execution of agreed-upon decisions on the specified dates like granting of permits to villagers for the collection of *bhabbar* grass and fodder grass. All major issues are discussed in the GB meeting and require sanction from all members for implementation. Major decisions include operationalization of activities like the kind of expenditures to be made with the money existing with the Society, fixing the price of *datis*, the auction price for *bhabbar* and grasses, water pricing, elections, etc. All such decisions require the presence of the GB, and members sign the minutes notifying their consent. These major decisions require a two-third majority.

Functioning of the HRMS

Over the years, the HRMSs have emerged as strong institutions which have very successfully protected and managed forests along with the HFD. Most of them have been effective, accountable, and sustainable, and all this could be largely traced to their constitution, status, and functioning. With the recognition of the rights of secondary members and the traditional use rights, most HRMSs have emerged as homogenous groups, irrespective of the members coming from different socio-economic and cultural backgrounds. Consistent communication and unhindered social interactions have helped in the process.

There is a general agreement with the set of norms and procedures (both formal and informal) adopted by HRMSs to regulate actions of individual members, and also to ensure equitable rights and responsibility of all members including minorities and women; this has prompted members to identify with the institution. A fairly transparent and accountable functioning is evident from the records pertaining to all monetary transactions being maintained. Minutes of all meetings held and major decisions taken in a participatory and open fashion are accessible to the members for reference and cross-checking. Periodic elections to the MC are conducted wherein the accounts are presented to the GB along with the significant achievements for the year under review.

Penalties are imposed by the HRMS for non-adherence to agreed rules and norms. Members do face suspensions/termination with the consent of the GB for severe offences. HRMSs have an excellent conflict resolution mechanism which is aided by the strong trusted leadership and impartial external agencies including the FD and TERI. TERI has been the facilitating agency since 1990. The HRMSs being registered with the Registrar of Societies under the Societies Registration Act of 1860, enjoy an independent legal status to enter into, and terminate, agreements with the HFD. This provides them the room to be equal partners with the HFD.

The key to the functioning of HRMSs in Haryana are the village meetings. The meetings involve all members in the activities of the HRMS, with specific focus on the involvement of women in the entire process. Elections to the MC are also held. The process of conflict resolution has helped in solving problems without giving them a chance to grow and destroy the institution.

Typically, the approach to village meetings is marked with closer identification and involvement with issues concerning membership, records, account keeping, fund management, decision-making, benefit distribution, resource demarcation, fodder and fibre grass leases, plantations, water-harvesting dams, and transparency of the HRMS functioning. Involving a broader cross-section of village population has diffused the concept of the HRMS over a wider section of the village effectively, which had earlier remained polarized in a few office-bearers and leaders. Attitudinal change and motivation of members, including women, have translated into enhanced support and improved functioning of the Society.

There is a perceptible shift towards the enhanced role of women with regard to their representation and participation in the functioning and activities of the various HRMSs. There is greater involvement of women in meetings, elections, decision-making, and operational activities of the HRMS with the passage of time. Women are encouraged to discuss their problems and priorities, and potential contribution towards forest management and protection.

Where the regulation of the extraction of forest produce is concerned, the HRMSs have devised rules that regulate the harvest and collection of forest produce by its members. These rules are seen to ensure that users' needs are met both adequately and equitably; harvesting rules must also ensure sustainable levels of exploitation. The extent and periodicity of extraction of different products is adjusted against the changing conditions of forest ecosystems. Even *bhabbar,* which is for commercial sale, is provided to members for their domestic requirements. Usually, the President of the HRMS provides a permit to each member for *bhabbar* extraction. *Dati* rates are fixed after a great deal of deliberation, and there are umpteen instances where their rates have either been lowered or waived through consensus for the poorest farmers, or those likely to harvest less frequently. Among the methods that HRMSs follow to regulate the use and prevent illicit extraction include verbal warnings, fines, threats of social ostracism, or turning offenders over to the FD. However, the needs of non-members are also met; they are allowed to collect NTFP at higher rates.

The process of electing the new MC has come to involve updating and review of the Society records on membership, resolution, *dati,* water charges, income, and expenses. The new office-bearers are elected after clarification of past activities and records in GB meetings. The practice of undertaking informal participatory exercises on records and accounts has made a positive impact on wider involvement of communities. Involvement of the HFD field staff and women has been emphasized by ensuring their presence, and inclusion of women in the MC through popular mandate.

Due to the complexity and diversity of stakeholders and stakes, both within villages and between/among societies, conflicts have arisen. The origin and nature of conflicts is influenced by the socio-economic profile of the community, the functioning of the HRMS, and the level of community participation in the HRMS deliberations. In several instances, conflicts over resource demarcation or benefit-sharing or utilization of funds also indicate improved understanding and increased involvement of people in all aspects of societal functioning.

Rights and responsibilities of the HRMS and the HFD under the JFMP

Under JFMP, the policy document and the rules have laid down the rights and responsibilities of the HFD and the HRMS. These have been reproduced in Tables 1 and 2.

Table 1. Rights and responsibilities of the HFD under the JFMP

Stage	Rights	Responsibilities
Planning	Not to enter into an agreement, if the majority are unwilling to accept responsibility	Facilitate discussion of planning options and provide technical guidance; follow the procedure outlined while reaching JMAs. Provide technical and financial inputs in planning; facilitate management capacity building of the HRMS.
Implementation and initial management period	Evaluate joint management functioning of the HRMS and elections to the MC, and equitable sharing of benefits among members; redefine the duties of the HFD personnel to make these compatible with implementing the Joint Management Policy. This should bind them to take prompt action against persons wilfully causing damage or attempting theft of forest produce from the Management Area (MA), who are brought to the notice of the staff by the HRMS, and report the action taken to the HRMS president concerned.	Ensure that the most disadvantaged men and women members of the HRMS have access to forest produce for meeting their bonafide needs of firewood, fodder, fibre, etc. by promoting consultative and accountable decision-making by the HRMS office-bearers.
Ongoing implementation	Refer case to appropriate federative HRMS body if an HRMS is not fulfilling its responsibilities.	Ensure that the HRMS gets its share of increased production; assist the HRMS get registration, strengthen functioning and monitor its performance; oversee elections and annual audit of accounts.
	Sign each JMA, and inform different concerned wings (production, working plan, social forestry, Kandi project, etc.) of the HFD about it, and ensure that any future work in the MA is done in accordance with the JMA in consultation with the HRMS. All JMAs shall be incorporated in working plans or the concerned Divisional Forest Officer (DFO) shall obtain the necessary deviation.	Where a water-harvesting dam is to be built under the JFMP, involve villagers in site selection, pipeline layout and ensure that a dam system is completely functional before it is handed over to the HRMS.

(*Continued*)

Table 1. *(Continued)*

Stage	Rights	Responsibilities
	Train the HFD personnel to enable them to acquire the necessary skills for implementing the Joint Management Policy, and to integrate the same in the regular training curricula for the HFD personnel. In this, emphasis shall be given to practical methods for promoting women's equal participation in all aspects of the HRMS's decision-making.	Authorize the DFO to ensure that the accounts are maintained properly by the HRMSs and presented in the annual GB meeting in the month of April.
	Encourage involvement of grassroots non-governmental organizations (NGOs), if any, knowledgeable individuals/ activists, academics and researchers in the development of the programme.	Authorize the Block Officer to be an ex-officio member of the Executive Committee and help the HRMS in maintaining records including cash accounts; ensure equitable distribution of the usufruct which may be in cash or kind.
Dispute arbitration	Appoint a senior officer to arbitrate on disputes between the HRMSs and the HFD	Help resolve disputes within the HRMS.

Table 2. Rights and responsibilities of the HRMS under the JFMP

Stage	Rights	Responsibilities
Planning	Seek information on all aspects of joint management and not enter into agreements unless satisfied about potential benefits.	Participate in the planning process, define membership rules and responsibility of members for protection and management; define rules through open discussions for equitable distribution of benefits among members, take major decisions only in general house meetings, and agree upon a system of fines/punishment for members who violate rules.
	Execute forestry works in accordance with the microplan under supervision of the HFD personnel. For this funds may be provided by the HFD and/or obtained from independent sources such as National Wasteland Development Board, National	Develop a microplan through participatory microplanning with the assistance of the HFD personnel; meet the bonafide domestic needs of the members regarding forest produce traditionally used by them on a sustainable basis from the MA

Table 2. *(Continued)*

Stage	Rights	Responsibilities
	Afforestation & Eco-development Board, Centre for Advancement of People's Action for Rural Technology, and National Bank for Agriculture and Rural Development etc., after due authorization by the government.	before considering sale of such produce; meet the subsistence needs of the economically disadvantaged members and the raw material needs of artisanal producers such as bamboo-basket and rope-makers and give them priority over increasing the HRMS's cash income.
Implementation and initial management period	Get grass, *bhabbar*, bamboo, water, or other produce as per agreement; inform HFD personnel of any person(s), particularly, non-members, wilfully causing damage in its MA or attempting theft of its produce.	Contribute voluntary labour, if so planned. Protect the area from open grazing, and punish member offenders as per rules. If this is ineffective, authorize FD to punish offenders; conduct regular MC and GB meetings to keep all members informed of the progress and increase consensus; honour all its commitments made in the JMA and protect its MA from encroachment, cultivation, grazing, fire, and illicit felling or wilfully causing death of trees by girdling. For this, it shall evolve a code of conduct for its members, which may include specifying fines, the HRMS may levy, or prescribe penalties for those members violating the code.
Ongoing implementation	Harvest increased production and get its share of income as per agreement.	Re-invest part of HRMS income into its MA; fulfil all agreed responsibilities
	Where the HFD has built a water-harvesting dam or a *kuhl* system, manage water distribution from it on equitable basis and take care of minor repairs and maintenance through levying water charges on its members. During the rainy season, keep a vigil on the dam and in case of any breach or chances of a breach in the dam, immediately inform the beat forest guard and take all protective measures to save the dam. All members of the HRMS shall have the right to claim an equal share of the water, irrespective of whether they own land or not.	In consultation with the concerned Range Forest Officer, evolve rules for its members for collection/ harvesting of forest produce such as fodder, grass, dry and fallen wood, prunings, thinning, small timber and poles from its MA in a sustainable manner.

(Continued)

Table 2. *(Continued)*

Stage	Rights	Responsibilities
Dispute arbitration	Levy fines on offending members. Withdraw membership of chronic offenders. Revise by-laws, when necessary.	Settle disputes within membership. Refer violation of rules by non-members to the HFD. Assist the HFD personnel in resolving conflicts with residents of neighbouring villages over competing claims in the MA.

Relationship of HRMS with other local institutions, notably the *Panchayat*

The only other strong and well-entrenched, village-level institution co-existing with the HRMS is the *Panchayat*. Many small committees/groups have been created by different government agencies for developmental programmes. The HRMSs (wherever existing) and the *Panchayats* have emerged as significant grass-roots organizations. While *Panchayats* are traditionally state-promoted organizations having representatives from the village people, HRMSs being promoted by the HFD and an NGO are equally or more representative, and equitable in nature.

The mandate of the two institutions are fairly clearly defined, and areas of operations/work are more or less demarcated. The *Panchayats* derive their funds from the state government and these funds are spent on developmental activities, a large proportion being deployed for employment generation. On the other hand, the funds with HRMSs are basically derived from membership and fees levied by the HRMS on fodder grass and water, that are accessed by the members, while a majority is from the management of forest areas for *bhabbar* grass. HRMSs take forest areas on lease from the HFD under JMA, and these areas are managed for fodder and *bhabbar* grasses. There are different systems under which HRMSs manage these forest areas, and this essentially decides the profits to HRMSs. The amount fetched by societies over and above the lease amount submitted to the HFD, on the sale of *bhabbar*, goes to the HRMS fund.

This fund has been used, in many instances, for installing and creating infrastructure for use by the entire village. Among the constructions are schools, community halls, roads, pipelines, equipment, etc. These funds with HRMSs are a source of strength when they are contrasted with the fairly fund-starved *Panchayats*. There are instances where the HRMSs have often contributed to the *Panchayat* funds to facilitate the completion of certain activities when funds fell short. In fact, these expenditures were issues of discussion in many meetings, and had led to the passage of certain resolutions for the working of HRMSs. It was decided that major expenditures were to be approved at GB meetings, enough money for the payment of the next year's lease to the HFD had to be set aside, sufficient money for other exigencies had to be ensured before such funds could be made available for *Panchayats*. The involvement of HRMSs by *Panchayats* has been prominent in afforestation activities where land has been provided by *Panchayats* to HRMSs. Most plantations have been fruit-bearing species to accommodate the people's needs.

As far as the relationship of HRMSs with other agencies is concerned, the district administration is more than convinced that these HRMSs are ideal agencies for undertaking development works having certain problems. If development work is to be pursued by the HRMS, the disbursement process will have to be changed because these HRMSs would not have funds for undertaking such projects without money sanctioned from the government or other funding sources. The employment assurance scheme of the government comprises labour of 70% and materials worth 30%; and the HFD is looking more and more at the HRMS to undertake such activities, which would provide excellent opportunities for wage labourers and the landless to gain livelihood. Another agency which has seen a fair degree of involvement with HRMSs is the Fisheries Department, which introduces seed into the dam reservoirs. These dams are leased out by the Society to contractors, who, in turn, harvest the fish. This provides the HRMS with additional funds.

There have been instances where greater cooperation between HRMSs and other programmes, namely, the Kandi programme, etc., could have been closer and better. All this reflects the potential for HRMSs to get involved with various developmental programmes of the government through the HFD, the district administration, etc. What is needed is the change in the mindsets of all the people involved to accommodate these people's institutions. Also, the issue of power struggle between HRMSs and *Panchayats* has not surfaced in any of the villages, and with the current clearly-defined cooperation in place, this seems to be a remote question.

Management and utilization of funds of HRMS

With most HRMSs having substantial funds available, some incorporations have been made in the by-laws and resolutions have been passed in individual HRMSs regarding the utilization of these funds. However, the government has proposed certain guidelines in the management and utilization of these funds by HRMSs. The income accruing to HRMSs from various sources would be managed and utilized as separate funds such as *Kalyan Kosh* (Welfare Fund), Forest Resources Development Fund (FRDF), and Village Development Fund (VDF). The details of each of these funds is presented below.

Kalyan Kosh

A *Kalyan Kosh* would be set up from the contributions available from each HRMS: an annual contribution of 10% from the net proceeds of sale of surplus *bhabbar*, and another 10% from the net proceeds of sale of timber.

The contributions by the respective HRMSs will be pooled into a *Kalyan Kosh* at the divisional level. The concerned DFO will maintain this fund as a personal ledger account, to be operated with due concurrence of the Principal Chief Conservator of Forests/Chairperson of the State-level Working Group (SWG), as authorized to do so by the SWG, till a federation of societies comes into existence. The *Kalyan Kosh* would be utilized for the promotion of the activities of the HRMS and for expansion of JFM in Haryana.

FRDF (Plough-back fund)

- FRDF would help in recycling a part of the income generated from the forest (under joint management) into the asset itself.
- FRDF would be set up at the HRMS level from the contributions made by an HRMS, an annual contribution of 30% of the HRMS's share from the proceeds of sale of surplus *bhabbar*, and 30% from the share of timber.
- FRDF would be retained by each HRMS as a separate bank account jointly operated by the DFO and the concerned HRMS functionary (according to the by-laws) with due approval by the GB of the HRMS.
- FRDF would be used for the improvement and development of the MA according to the prescriptions of the management plan.

VDF (HRMS Fund)

- VDF is to be used by the village community.
- VDF would consist of the income of the HRMS from various sources, including that available from the HRMS's share of proceeds from sale of surplus *bhabbar*, from timber, and all other sources.
- VDF would be maintained by the HRMS as a separate bank account to be operated by the cashier and any of the other two office-bearers, with due approval of the GB, according to the procedures stated in the by-laws of the Society.
- VDF is to be used for village development and community welfare as decided by the GB.
- VDF is to be used strictly on non-religious and apolitical activities.

The HRMSs, apart from providing an opportunity to all sections of the village society to be equal partners in its functioning and decision-making process, have also evolved, over the years, as sustainable and strong institutions. A clear understanding of their roles and responsibilities *vis-a-vis* those of the HFD and the impartial and transparent functioning have led to the establishment of HRMSs as distinguished institutions. The fairly large amounts of funds available with the HRMSs and the recent government rules regarding the contribution of HRMSs towards the village and forest resource development constitute a recognition of the capacity of HRMSs to make a meaningful contribution to the village development process as a whole.

Enabling Participation

Introduction

Joint Forest Management (JFM) has been defined as the sharing of products, responsibilities, control, and decision-making authority over forest lands, between forest departments (FDs) and local user groups, based on a formal agreement. However, effective participation forms the core of the entire process. This chapter provides an insight into the participatory process needed in the development of a JFM approach. The primary purpose of JFM is to create conditions at the local level, which would enable improvements in forest condition and productivity. The second goal is to support an equitable distribution of forest products (World Bank 1995). The accrual and distribution of benefits, which is the key determinant of success of such an approach to resource management, rests largely on the processes of people's participation.

JFM calls for an approach to management that is multi-sectoral, interdisciplinary, process-oriented, need-driven, flexible, and participatory; while the FD by nature is sectoralized, uni-departmental, target-oriented, resource-driven, standardized, and authoritative in terms of management. JFM needs a broad interlinking of institutions involved in R&D and implementation so as not to be isolated and further fragmented from the field of sustainable land-use management (McGean 1991).

The promise of people's participation in rehabilitating degraded forest lands had been recognized internationally since the Eighth World Forestry Congress of 1978. In India too, with the promulgation of the National Forest Policy of 1988, the emphasis of forest management shifted from revenue generation and meeting of industrial wood requirements to the meeting of the subsistence requirements of people dependent on them. On a pilot scale, however, participatory forest management had been initiated in India in some pockets, after the success of the Arabari and Sukhomajri experiments in West Bengal (1972) and Haryana (1976), respectively.

The general agreement over the importance of people's participation and the difference in perception of the meaning of the term *participation* has resulted in *participation* taking on different forms in different states, and even within the same state. Participation has many and diverse theories, concepts, and implications.

In practice, people's participation is frequently understood to mean people's participation in the government's scheme. The failure of government functionaries to elicit such participation has led to the popular notion that 'people are not motivated enough...'. Motivation can only be in response to a favourable stimulus, and participation is the embodiment of a relationship based on the sharing of rights, responsibilities, and authority.

Initiatives in Haryana

The involvement of people in the JFM process in Haryana was incidental to begin with. As mentioned in the previous chapter, scientists from the Central Soil and Water Conservation Research & Training Institute at Chandigarh, in trying to find a solution to the silting of the Sukhna lake, initially looked only for mechanical and vegetational checks in the forest catchment. However, with no solution in sight in spite of yearly interventions, the attention of these scientists was drawn to Sukhomajri village whose low-grade cattle and goats grazed in the forests. Grazing along with fuelwood which included branches of standing trees and plants, and dead and fallen wood, took its toll on the conservation efforts in the adjacent forest catchment. Following a discussion with Sukhomajri villagers, scientists realized the insurmountable task they faced for the rehabilitation of forests in the absence of alternatives to people's forest-based livelihoods.

Indeed, the revelation was that development, in this case catchment rehabilitation, appeared less and less to depend either on resources or on technologies, but there was a need for attention to be focused more and more on people and institutions which could mobilize and manage resources, and technology extension and technology adaptation for the common good. It was realized that technologies, resources, and people's institutions, each had to contribute in different complementary ways to raise productivity. Sukhomajri, thus, provided a glimpse of the evolution of a new paradigm of community-driven forest management, through socially equitable village institutions.

The process approach

A conscious pursuit of JFM on the lines of the *process approach* was undertaken. The process approach views the implementation of any programme as a process comprising several developmental stages. This is in contrast to the *project-based approach* which is more static in nature and fails to give due recognition to the importance of evolution and adaptation in the implementation of a programme. The process approach recognizes the considerable uncertainty inherent in any such programme, and is characterized by continual openness to redesign and in adaptation to changing circumstances (Gow, Vansant 1983).

As a consequence of this approach, the views and opinions expressed at all levels, particularly by those who were the most actively involved—the local population and local-level forest staff were incorporated into this programme. This was done while expanding after the experimental stage at Sukhomajri and Nada. The efficacy of this approach is agreed upon in development literature. According to this approach, creating effective participation is a gradual, evolutionary process in which both project staff and potential beneficiaries are willing to try alternatives, discard them when they prove unworkable, and try others. On-the-spot study and an interactive style of problem-solving are relied on, rather than targeting remote expertise. It is in this systematic fashion that local communities have discovered the possibilities of exercising choice, and, thereby, developed the capability of managing resources they are dependent on.

There are certain significant features of the process approach that was adopted in Haryana. There was appreciation of the knowledge and potential pertaining to needs and solutions of the communities by the Haryana Forest Department (HFD) staff during their dialogues. With every passing phase, there was constant learning and capacity-building in the HFD and the Hill Resource Management Society (HRMS), in order that the process be sustained. Thus, a smaller group of resource-dependants assumed an active, primary role in forest management. The process was forged on the basis of trust, dialogue, and mutually-defined rights and responsibilities of both parties. Joint problem-solving exercises helped in transferring the ownership of the programme to the villagers.

Thus, the introduction of Joint Forest Management Programme (JFMP) in new sites has distinct phases, wherein communities are introduced to the programme concept, opportunities, and roles are mutually-defined and agreed upon. Incentives for the communities are also worked out. Another important role is of undertaking research. The Tata Energy Research Institute (TERI), in collaboration with the HFD, studied the usefulness and efficacy of incentives and strategies on eliciting participation, and accordingly incorporated modifications into the programme. Monitoring and evaluation of the programme is essentially oriented to the benefits received by the communities.

Institutionalization of JFM

Rural communities have limited opportunities to pursue their own initiatives, develop problem-solving skills, or the capacity to mobilize and manage resources at the local level. There is a large educational and status gap between government staff and the poor. Often, there are ethnic and linguistic differences, complicating communication and mutual regard. There is a common attitude of superiority, which exalts expert knowledge and deprecates what the poor know or are capable of doing. All these ills that plague the government–people relationship existed in the FD–people set-up.

However, a distinct feature of the JFMP has been its gradual and cautious progress. Changes have been effected at different levels to further the programme. The active participation of people has been achieved largely because the benefits that have accrued to them have been tangible and relatively immediate, as direct products of their participation. A consistent set of incentives to support targeted behaviour among the villagers has been achieved, and these incentives that were designed to further participation catered to both the short- and long-term interests of villagers. There has been a change in bureaucratic reorientation to improve programme-organization fit between department capabilities and the new role JFM entails, but in-depth changes in the values, structures, and operating systems of the department still need working on.

This is evidenced from the fact that though a project management unit called the Joint Management Unit has been effective in the short run, its effectiveness in the long run is of immense value, and there is still a need to institutionalize and sustain it. Though the accountability of the forest field staff still needs improvement, significant strides have been taken to ensure accountability of the HFD to the HRMS. The same is true of the HRMS, where the forest staff are ex-officio members of the societies. A great deal of bureaucratic reorganization must have been attempted through trainings and workshops to change individual attitudes and values, but changes in job definition, performance criteria, career incentives, bureaucratic procedures, and organizational responsibilities are being worked upon. Compensation and promotion systems for local project staff to work with the HRMS, and strengthen their capacity to address important issues of forest management and community needs, are still not in place.

Participation

The observation that local participation in planning should start at the assessment of needs stage rings true and conforms to the JFM experience at Sukhomajri (Cohen, Uphoff 1980). In the absence of information regarding the plans for the forest area, Sukhomajri villagers did not get an opportunity to be a part of the process. In due course, with the villagers consenting to cooperate, the programme was successful enough to be replicated with site-specific modifications in over 60 sites in the area.

Typically the interaction between the management (in this case, the HFD) and the local people could fall under various categories based on the degree of openness and initiative that the FD and the communities exhibit (Table 1). While the relationship between the FD and the people is crucial to participation, in that participation cannot be commanded in an authoritarian top-down manner (World Bank 1995); there are important features of the enabling environment in which participation takes place. The first is the institutional condition which is conducive for each member of the village community, irrespective of caste or economic status to be part of it, and to be able to influence working and decision-making.

The dependence of communities on forests, and the economic incentives they derive from forest protection and management, is crucial, but it is even more crucial for this realization to dawn on the FDs, which have been policing forests for years. The presence of a legal back-up for a shift in the entire management style

Table 1. A typology of participation: how people participate in development programmes and projects

Typology	Characteristics of each type
Manipulative participation	Participation is simply a pretence, with 'people's representatives on official boards but who are unelected and have no power.
Passive participation	People participate by being told what has been decided or has already happened. It involves unilateral announcements by an administration or project management without any listening to people's responses. The information being shared belongs only to external professionals.
Participation by consultation	People participate by being consulted or by answering questions. External agents define problems and information gathering processes, and so control analysis. Such a consultative process does not concede any share in decision-making, and professionals are under no obligation to take on board people's views.
Participation for material incentives	People participate by contributing resources, for example, labour, in return for food, cash or other material incentives. Farmers may provide the fields and labour, but are involved neither in experimentation nor in the process of learning. It is very common call this participation, yet people have no stake in prolonging technologies or practices when the incentives end.
Functional participation	Participation seen by external agencies as a means to achieve project goals, especially reduced costs. People may participate by forming groups to meet predetermined objectives related to the project. Such involvement may be interactive and involve shared decision-making, but tends to arise only after major decisions have already been made by external agents. At worst, local people may still only be coopted to serve external goals.
Interactive participation	People participate in joint analysis, development of action plans and formation or strengthening of local institutions. Participation is seen as a right, not just the means to achieve project goals. The process involves interdisciplinary methodologies that seek multiple perspectives and make use of systemic and structured learning processes. As groups take control over local decisions and determine how available resources are used, so they have a stake in maintaining structures or practices.
Self-mobilization	People participate by taking initiatives independently of external institutions to change systems. They develop contacts with external institutions for resources and technical advice they need, but retain control over how resources are used. Self-mobilization can spread if governments and non-governmental organizations (NGOs) provide an enabling framework of support. Such self-initiated mobilization may or may not challenge existing distributions of wealth and power.

Source. Pretty (1995)

is essential for the empowerment of different actors to perform their roles. The passage of relevant rules by the government reflects the political will in whose presence, the operationalization of the programme is so much more smooth. The presence of all these conditions in Haryana, in differing degrees, has shaped the programme in the past decade.

When different HRMSs are analysed against the years of operation and maturity in handling/being part of JFM, three models of management emerge. These include consultation with the new HRMS, partnership with the older HRMS, and self-reliance with the earliest HRMS. Differing degrees of understanding of JFM and comprehension of their respective roles and responsibilities form an important factor defining models of participation.

There are certain characteristic features of the Haryana JFM experience. The programme saw progressive learning together by the HFD, village communities, and TERI (the facilitating NGO). This was essentially through Participatory Rural Appraisal, and the various tools that constitute it in terms of meetings, discussions, mapping exercises and transects, to name a few. This partnership has matured through different stages of meetings related to awareness generation on JFM, HRMS formation, formulation of by-laws, HRMS registration, establishment and strengthening of institutional mechanisms, and efficient functioning of the Society. A very important phase of the process was of planning together by the HRMS and the HFD of the plans and activities essential for forest management and their execution. The culmination of all institutional efforts would be the formation and establishment of an apex organization, the Confederation of the HRMSs, in the programme area. All through the process, TERI has played a facilitating role and will withdraw only at the culminating stage.

Institutional arrangements

Like other states, Haryana has benefited from local traditional leadership. However, political redefinition and the empowerment of new local governance bodies—the *Panchayat*—frequently undermined traditional community institutions. The former legitimacy of local leadership and traditions of collective decision-making were abolished and replaced by state-regulated representative democracy. The need for the creation of an institution different from the *Panchayat* was felt because of the iniquitous nature of Haryana villages, which reflected the interests of the existing power structure, and consequently were the least enthusiastic proponents of change. There was limited representation of weaker/marginalized sections in the *Panchayat*. It was felt that in order for people to feel less alienated from the forests, and to contribute meaningfully to community resource management of degraded forests, it is important that they identify with the institution that would operationalize this process.

The creation of the HRMS was not only to have representation of all families in the village, but also to ensure this participation through all stages of the Society's functioning including, sensitization, orientation, and collective action.

Among the important criteria that have influenced formation of HRMS include, close physical proximity to the resource, prior or current formal or informal rights, high forest dependency, perceptions of resource scarcity, traditional resource-usage patterns, and strong local leadership. In multi-caste villages, where the forest dependence level was different from each caste, those which had greater dependency on the forest were involved first. This was followed with the entire village being involved in JFM.

The second generation village forest protection committees are characterized by widespread multiplication and institutionalization of programme procedures such as registration, membership, conflict arbitration, and benefit-sharing. Trainings on gender awareness, women's programmes, process documentation, microplanning, and sustainable production systems based on non-timber forest products are important.

Sustaining participation

The benefits that members perceive from coming together under the programme is evidenced from their willingness to wholeheartedly contribute whatever is required of them. A great deal of exchange in terms of thoughts, views, and opinions that take place during meetings among all members, both men and women, is a common feature. There have been no cash incentives for members, but benefits are substantial in terms of increased incomes due to increased availability of grasses for domestic consumption along with irrigation water to augment agricultural production. The increased production of *bhabbar* grasses and better management have resulted in greater incomes for the societies.

The income generated by the HRMS has been put to creation of infrastructure of common interest. These have ranged from construction of roads to water pipelines, community halls, etc. Specific incentives in terms of increased forest produce supply, greater water availability, etc., have been discussed in detail in this document. While it is true that the section of the village that has greater dependence on forests has greater interest in its protection and management, other sections have contributed in their own way to regulate forest use.

In case of produce other than *bhabbar* grass, fodder grass, and water, the policy provides that for produce like timber, katha, fruit, and medicinal herbs, HFD's net income from sales could be shared with the HRMS. The HRMS may then invest some of its share of the income back into the JFM area for increasing productivity further. While some of the HRMSs have been protecting forest lands with only trees (with little grass due to *lantana* infestation) for a decade now, timber revenue distribution is still due. This would ultimately influence the furtherance of people's interests.

The impacts of these targeted incentives for the villagers have broadly been in the form of increased employment, greater empowerment, increased sense of ownership of forests, and decreased conflicts. While employment in case of milch cattle owners is imputed, in that increased supply of fodder has resulted in increased livestock holding and greater returns from milk sale, the impact on *Bhanjadas* and *Banjaras* is more directly determined.

Studies have shown that the incomes for *Bhanjadas* increased on an average by 54% (Varalakshmi 1992), and that the *Banjaras* had increased their earnings by 26.2% (Vijh, Arora 1993), with the JFMP. This is essentially because of the increase of bamboo supply as mentioned in earlier chapters from 50 to 100, from six to nine months, and royalty from Rs 30 to Rs 7 for 100 bamboos for the *Bhanjadas*. With the availability of *bhabbar* at reasonable prices from the HRMS, the *Banjaras* of respective villages have benefited. More important has been the benefits to women because it is they who are involved in these forest-based enterprises. This is also reflected in the empowerment of women. On the issue of empowerment, it is not uncommon now to see members of the HRMS, from the lower echelons occupying positions in the *Panchayat*, or bidding at auctions (e.g., for village tanks to undertake pisciculture), which was earlier unknown. All this reflects the need for sustaining these incentives to maintain the participation levels.

The inherent strength and enterprise of the HRMS is a decisive factor in bringing the village communities and the FD together into a partnership mode to collectively protect and manage forests. The beneficial effects of the programme have been tangible. The increases in tree species, density, quantum of grasses are all tangible benefits. Further, unlike forestry plantation activities, where trees take a lot of time to grow and yield benefits, the increased availability of both fodder and fibre grasses after the first year of protection has motivated members further towards protection. All this reflects the importance of incentives, and the need for their availability on a sustained basis in order to keep up the current levels of participation.

Perceptions on participation

While participating in the programme, different actors perceive the programme differently. These perceptions mainly reflect the problems/hurdles faced by them in their individual capacities while undertaking their respective roles/parts in the programme. A majority of the concerns have been reconciled.

Field-level FD staff have always expressed the need for greater sensitivity and commitment of the higher-level staff of the HFD to the programme. The need for institutionalization of JFM in the working of the HFD is crucial to overcome problems related to transfer of staff. Due to the fact that the failure or success of any project cannot be traced to a single person or cause, there is a need for greater ownership by all actors such that responsibility or credit is shared equally. Clear orders for restricting practices such as grazing, that are unhealthy for the regeneration of forests, are desirable. The disparity in the desired (by villagers) tree species and those planted is often traceable to orders from the top.

Members of the HRMS have vouched for the efficacy of the procedures for vigorous monitoring of the working of the Society/Management Committee. There is widespread agreement that two decades back, the behaviour of the forest guards (FGs) and foresters was very formal and often hostile, leading to quarrels. Over the years, not only has their interaction with people increased, but they have become more sensitive to people's problems and also more friendly. Now, the FGs often attend village functions and even marriages. Further, there are official programmes like training and workshops that have department staff and the HRMS members attending together and interacting. No programmes of this nature, i.e., the training workshop, were organized earlier.

While HRMSs have been effective in the protection and conservation of forests, and also for the development of the village, support from the HFD to counter political interference is desirable. Villagers feel that while the forest land is owned by the government, the profits of increased productivity resulting from community protection should be shared equally by the community and the FD. Owing to the socio-cultural milieu of Haryana, women are placed in a peculiar situation. While a few express doubts about their being a part of the HRMS, others feel perturbed on non-information. Women are equally aware of the different incentives offered by the programme, and have expressed the need for greater streamlining of processes for greater equity in benefit distribution, especially where water from dams is concerned.

Though the rules for JFM are pending with the Haryana Government, the commitment of the FD to JFM is evident in the steps taken to reconcile the bottlenecks in the way of programme implementation. The vibrant nature of working groups across different levels of the programme further reflects their participation and commitment.

Reflections on participation from Haryana

The Haryana experience of participatory natural resource management has highlighted some tenets central to the theme of people's participation.

- People will participate only when they want to; what they want is governed by their immediate and basic needs, and how well their interests are served in the process of participatory resource management. For effectiveness, the proposed system should serve both local and broader ecological, social, and economic interests.
- A 'sense of ownership' cannot be instilled in the community without giving them any *real* ownership of the resource.
- Creation of government assets in villages is not enough to elicit participation; emphasis should be on creation of village/community assets with government assistance.
- There is a need for a balance of rights with responsibilities to enable the community to effectively discharge its responsibilities.
- The formation of institutions for self-governance and resource management may be stimulated with external inputs, but ultimately they must grow and evolve from within, and suitable *systems* need to be designed and developed for facilitating this process of growth and evolution.

- Strengthening or reorientation or widening of scope of existing village institutions should be studied and explored as a viable option, instead of imposing on the community an organization alien to it.
- The village is a complex set of several sub-sets. It is not a homogeneous community that can be treated as a single entity. These sub-sets in the village may be formed on the basis of occupation, caste, class, gender, socio-economic or political status, and so forth, and such a classification need not result in the formation of mutually exclusive sub-sets. However, all sub-sets exhibit different needs and kinds of dependencies on the forest resource. For meaningful participation, there should be adequate representation of, and consideration for, the nature and extent of dependence of each of the sub-sets. For any intervention to serve the cause of the disadvantaged section(s), the rights of no particular section should be adversely affected, or, any regulation should uniformly and proportionately influence all users of the resource.
- Resource sharing, or allocation, between sub-sets should be in accordance with the cost-sharing mechanisms developed by the institution.
- Decision-making and design of operational rules for management of the resource should be done collectively, with proportional representation from all user sub-sets in the village. Proportional representation should be governed not so much by numbers, as by the degree of dependence on the resource, and implications of the decision in terms of opportunity or other costs to be incurred by those affected.
- There is a need for systematization of the process of conflict arbitration; rules should be framed collectively, and *understood to mean the same* by all, for their implications on resource use.

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Benefit-sharing Mechanisms

Introduction

Joint Forest Management (JFM), like all social processes, is dynamic in nature. The important assumptions that have guided the formation and establishment of institutions for community management of forest lands apply to the Joint Forest Management Programme (JFMP) as well (Ascher 1995). This includes limiting the number of users of a particular resource, which provides a greater chance for sustainable practices for resource extraction. This is further enhanced when the group has an interest in the long-term sustainability of the forests, as long as they know that they can continue to enjoy benefits from the forests. With the provision for people to police the forest, there is a greater possibility for forest regulation because these people have a strong interest in preventing the abuse of the forests. They also have the greatest potential in terms of capability and motivation to regulate effectively.

Thus, it is seen that under JFM, there is a sharing of responsibilities among the communities and some decentralization of the authority from the Forest Department (FD) to the local bodies. Further, there is also the regulated use of rights by the communities in resource extraction and by the FD in policing the forests against the misuse of rights of communities. Another very important aspect of the entire programme is the complex issue of sharing of benefits derived from the protection of forests between the community and the FD; and most importantly among the members of the community itself.

Rules for benefit-sharing

The evolution of the concept of people's participation in Haryana, which began in mid-70s, as mentioned before, is based on equitable distribution of benefits of community participation. The experiment in participatory management initiated at Sukhomajri, after being replicated at village Nada with similar results, was extended to other villages in the Haryana Shivaliks. To sustain the interests of participating villagers in the JFMP, it was essential that the benefits of increased production from forest areas, due to protection, be shared with the local village communities. Thus, in 1983, the Haryana Forest Department (HFD) offered annual leases of *bhabbar* and fodder grass from the adjoining forest area to the local village institution.

It is a well accepted fact that when authority is put in the hands of the leaders, whether they are formal or informal leaders, because of their prestige and politico-economic power, the low-income group is not necessarily well represented or well served. This was one of the reasons for the creation of separate bodies in the villages to take charge of different resources. From the Water Users' Associations, the village-level resource management institutions evolved into the Hill Resource Management Societies (HRMSs) with a mandate for managing a whole range of resources, including the forests for *bhabbar*, fodder grass, and fuelwood; the water harvesting dams for irrigation; and the bamboo forests for obtaining raw material for basket-making. Apart from the HRMS structure and functioning procedures, an important development witnessed was the evolution of systems for sharing of benefits of protection among society members. Thus, in Haryana, the benefit-sharing and distribution process, which is a very important step in the stabilization of an institution, has been formally implemented and accepted by the people.

Rules or guidelines for sharing of forest produce and benefits between the HFD and the HRMSs have been provided in the JFM policy, and later in the draft rules for the Haryana JFM.

Policy

Regarding the sharing of increased production, the basis of sharing between the HFD and the HRMSs has been defined for different forest produce and incentives (GoH 1990). Where the system of auctioning grass leases to private contractors is already in operation, the present practice of giving the lease to HRMSs at the average price fetched during the previous three years could be continued. As hand-harvested grass is mostly used by the poorest households, at the most, the lease charges could be increased by five per cent annually from the third year onwards to account for inflation.

In areas where the lease system is not in operation and the villagers have been enjoying free grazing rights, it will be difficult to persuade them to stop grazing and start paying for hand-cutting the grass as well. In such areas, no charges for grass-cutting should be introduced by the HFD. The HRMSs on its own may decide to levy a minimal charge to cover its running expenses.

In cases where the HFD assists the HRMS to get irrigation water either by constructing a dam or by installing/renovating a *Kuhl* system, the initial financial investment shall be made by the HFD. HRMS members could contribute some voluntary labour for digging the pipelines as was done in main *Wada* (hamlet). However, depending upon the membership size of the HRMS, it could be laid down in the agreement that once the system is functioning normally, all protection, maintenance, and repair expenses for the system must be raised through levying adequate water charges to the users. The HFD will provide additional financial assistance for maintenance and repairs only in exceptional cases such as in case of dam; excessive rate of sedimentation; rectification of technical faults.

In the case of commercial produce like *bhabbar,* to begin with, the lease money, hireable to HRMS can be continued as the average amount fetched through open auction during the previous three years. However, the increase should be monitored annually. The HRMS could be bound by the agreement to invest half its income from *bhabbar* either back into the joint management area or other developmental and social activities for the common benefit of its members.

Rules

The rules in their final stage pending approval of the Government (GoH 1997) have certain provisions for the sharing of the forest produce. The passing of these rules by the government would definitely be a shot in the arm for the entire range of forest produce and benefit-sharing arrangements envisaged and underway in the Haryana JFMP. All members of HRMSs may be permitted to collect dry and fallen wood, fencing material, limited numbers of bamboo and poles free of cost from their respective joint management areas for their bonafide domestic use and not for sale. Provided that, previously existing rights of members or non-members are not to be interfered with, the HRMSs shall regulate collection of the forest produce on a sustainable basis by framing rules for their members in consultation with the concerned Range Forest Officer.

As a part of its Joint Management Agreement (JMA), all fodder grass shall be given to the HRMSs at the average price obtained in open auction for the last three years preceding JFM. Where such information is not available, the price shall be settled between the Divisional Forest Officer (DFO) and the HRMS after taking into account the condition of the area and/or the price fetched by similar adjoining areas. Annual increment at the rate of one per cent of the above price is to be paid by HRMSs after signing the agreement. Payment for the fodder grass shall be made in lumpsum by each HRMS every year. In case of an exceptional drought or other natural disasters, the DFO may reduce the price to be paid.

As a part of its JMA, an HRMS shall have first right over collection and use of *bhabbar* grass from forest areas on an annual lease basis. The price of *bhabbar* grass shall be determined as the average price obtained in open auction for the last three years preceding JMAs which will be treated as the base price. When such information is not available, price will be settled between DFO and HRMS on the advice of the state level working group. The DFO may permit an HRMS to pay for the *bhabbar* in three instalments in exceptional cases. For the existing HRMSs, which dispose of surplus *bhabbar* grass after fulfilling their own requirements, there will be no increase in price for subsequent years. In case of the HRMSs which use *bhabbar* harvest for *ban* making, the lease amount will increase at 7.5% annually for every subsequent year. Those HRMSs, which dispose of surplus *bhabbar* through an open bidding, shall do so in a general body meeting, and in the presence of the concerned DFO or his representative.

The net income made from the sale of *bhabbar* by the HRMS from the joint management area taken on lease by it from the HFD shall be divided between the government and the HRMS in the ratio of 25:75. The HRMS shall contribute 30% of its share towards plough-back fund for further improvement of the joint management area, and another 10% towards *Kalyan Kosh*. The HRMSs of bamboo basket-makers would continue to get permits to cut a specified number of bamboos per household per month for nine months (October–June) every year as per the terms specified in the existing notification of the Government of Haryana on the matter.

Where the share of HRMSs from sale of timber from the joint management areas are concerned, the following provisions have been spelt out. The registered societies, already in existence prior to the notification of the rules, shall be considered eligible for their share of income from timber from the year in which they were registered. After 10 years of JFM, and to the satisfaction of the Conservator of Forests of that area, the HFD shall share the income from timber, at the time of final harvest, after deducting the expenditure incurred on felling, transportation, and auction. The ratio would be 70% to the government and 30% to the HRMS, provided that the HRMS shall contribute 30% of its share towards plough-back fund for further improvement of the management area and another 10% towards *Kalyan Kosh*.

Systems for benefit-sharing in HRMSs

The benefit-sharing arrangements in HRMSs are a reflection of their consciousness to equity issues. It is interesting to note that HRMSs have evolved different methods for catering to the needs of the different socio-economic sections of their respective villages. These arrangements have been evolved taking into consideration the resource status of the different households, their needs for different forest produce, capacity to pay for forest produce, etc.

Fodder grass

HRMSs decide upon a price for *dati*, which is the fee payable by the members to the HRMS for cutting fodder grass from the joint management area for the period October to March. There are a number of factors that define this rate, but what is true across all the HRMSs is that the *dati* charged by them is much lower than that charged by the forest contractor during the pre-HRMS period. However, there are instances where HRMSs have started charging nominal rates to members, even when they have rights for free access, but this is considered as a small price to pay for the freedom of access that the members have gained, in comparison to the harassment meted to them by the contractors. The important factors on which *dati* rates are decided include the lease amount payable to the HFD, HRMS expenditure in undertaking protection work, and the ability of families to pay.

Based on the amount that the HRMS has to pay to the HFD, which is again dependent upon the productivity of the forests, the *dati* rates are fixed to cover these costs. Also, the costs of the HRMS for protection of the forests find a place in the *dati* rates. There are many instances when there are differential *dati* rates for members based on their livestock holdings which essentially determines fodder grass requirement. The very poor families or for those households where women are heads of families, the *dati* rates are remarkably lower or not charged. Widows with no earning members in the family are also allowed grasses free of charge. This has helped many of the poorer households obtain fodder grass from the forests for their livestock. Since grazing in the forests is totally banned, families with goats (if any) are allowed to graze them on the village common lands. There are instances of landlords allowing the landless to cut grasses from their agricultural fields when they are unable to pay the *dati* money.

Bhabbar *grass*

Each member in the HRMS is allowed one to two head loads of *bhabbar* grass every year for domestic consumption. The netting on the cots in these villages is made of *bhabbar* ropes. Old men and women making ropes by hand is a very common sight in these villages.

In many villages, the *Banjara* community makes rope from *bhabbar* grass for a living. In such cases, the HRMS allows the *Banjaras* to collect more than the stipulated one to two. head loads. This community, from the same village or nearby villages, is employed by the HRMSs for *bhabbar* harvesting owing to their skill in doing so. They are either paid wages for the harvesting or are allowed half the harvest *in lieu* of wages.

Bamboo

The *Bhanjadas* are provided permits by the HFD for bamboo extraction every year. While they are responsible for proper harvesting of bamboos, clearing the forest of debris, and preventing fires; the other members of the villages obtain fuelwood and fodder grasses from the bamboo forests. While there are no charges for the grasses, all villagers are expected to help the *Bhanjadas* protect the forests from fires and thefts. Villagers have also been discouraged and fined for damages to bamboo shoots. The HFD in turn provides employment to the *Bhanjadas* in the bamboo forests especially during plantation and harvesting seasons.

Irrigation water

While the need for fuelwood, fodder, and *bhabbar* is spread across all sections of the village societies, the need for irrigation water is, however, well defined. The programme villages have a fair percentage of households, who are landless and are from the weaker sections, socially and economically, of the village society. The management of water-harvesting structures involve the protection of the catchment of the dam, the regulation of water use by charging water fee from individual landlords for use of irrigation water, and the auctioning of the dam reservoir for pisciculture. All the money collected goes to the HRMS fund.

There are the landed and the landless people in the village, and while the landed need irrigation water, the landless do not. Nonetheless, the reservoir catchment and the dam structure need the protection of all these members. Therefore, in the interests of equity, under JFM, both have an equal access to water, though the landless have little use for it. A few systems are known to have been evolved for this situation. The first is where the landless sell their share of water to the landed and are paid a rate decided by the HRMS, and, in some cases, a mutually agreeable rate is worked out between the two parties. Sometimes, the land-owner allows the landless to collect fodder from his agricultural land *in lieu* of the water, or they pay a higher price than the water rate set by the HRMS. In certain other villages, the landless are not charged any *dati* rates for obtaining fodder grass from the forest areas; in turn, they relinquish their rights over water.

The overall emphasis of the HRMS is to provide a stake for all members in the incentives that are available to the HRMS as a whole. Looking at the relevance of each incentive to each member, suitable arrangements have been evolved in the benefit-distribution process. Box 1 provides an example of a water distribution system in the village of Salehpur, where suitable benefit-sharing mechanisms were evolved.

Equity issues

Early in the rehabilitation process, the realization dawned that individuals could be motivated to collective action in pursuit of common goals, in this case regeneration and rehabilitation of forests, only when they were provided an incentive to do so. In the words of Olson, 'unless there is a coercion or some other special device to make individuals act in their common interest, rational, self-interested individuals will not act to achieve their common or group interests' (Olson 1971). This is not to say that people have options and opportunities and that they do not exercise their choice. The sheer lack of resources in certain families and limited resources in others leave them with no option but to be dependent on forests. But the efforts of the HRMSs, the HFD, and the support team that have gone into defining and evolving systems for benefit-distribution reflect the importance of resolving equity issues in eliciting community participation.

The issue of equity has been incorporated in the JFMP at all levels. All villagers satisfying the criteria of membership like residency in the village, traditional use rights, etc., have an equal opportunity to be members of the HRMS and its management committee. Both men and women have independent membership

Box 1. Water distribution system

In village Salehpur, due to the absence of a proper water distribution system, the water supply from the dam remained prone to misuse, overuse, wastage, inequitable distribution, and poor utilization. Most of the water was used for irrigating the fields closer to the dam even when the water could have reached distant fields. However, with the constitution of new committee the water distribution system has improved significantly and is working in a promising manner.

A general body meeting held on 15 October 1995, chaired by the President of the HRMS, decided on the following.

1. The dam water would be auctioned to a contractor who is also a member of the Society.
2. A six-member dam committee would be responsible for undertaking repair and maintenance of dam and pipeline. The committee constitutes of a member from the management committee and five members from the Society.
3. Only those members who have no arrears payable to the Society would be given water.
4. All members have equal right of two hours of water supply from the dam. The households with greater water requirement can purchase water shares from the landless or from those members who own fields beyond the command area. The water rights can be purchased at mutually negotiable rates between the seller and buyer. The water share would be retained in the reservoir if it remains unused.
5. The three lines of pipelines would be used one after another for the distribution of water.
6. After detailed comparison of hourly rates for water supply charged by the Minor Irrigation Tubewell Corporation, Irrigation Department, and diesel engine operators, the group decided to fix the rate at Rs 20 per hour. [During the deliberations, the proposal of fixing an hourly rate fluctuated between Rs 5 (land owners using water) and Rs 100 (landless and those with unirrigated lands).]
7. Repair and maintenance of dam and pipeline would be undertaken by the contractor. The material would be supplied by the Society.
8. The contractor will maintain proper record of water distribution and utilization amongst members which will be monitored by the dam committee.
9. Since the farmer would have a tendency to get more water while the contractor would like to give less, it was suggested that three threads of the sluice valve will be opened so that adequate water pressure is maintained for irrigating distant lands as well. The pipeline is not to be connected directly to the sluice valve as it causes frequent breakdowns. This would avoid wastage of water and rule out bursting of pipeline due to high water pressure.

The water was auctioned for Rs 3550, which was duly approved by the general body. It was decided that, in addition to the 400 m of pipeline obtained from the forest department, more pipes would be procured from the market and the FD. A list of all households will be prepared which will form the basis of water distribution and no decision will be taken without the approval of general body.

A visit to the village and interaction with the members has shown that the new system is working quite well resulting in irrigation of hitherto unirrigated fields situated at quite a distance from the village. The members are strongly supportive of the new system and are visibly enthusiastic about the availability of water to a large number of households.

opportunities. Being members, all villagers are entitled to the incentives offered to the HRMS by the HFD. Efforts have always been to ensure that all members of the village society enjoy equity in terms of access and use of resources. Consequently, access to the forests for extraction of fodder, fibre grass, and fuelwood is open to all members of the HRMS. So is the case with irrigation water, wherein the landless are also provided access to the resource. Likewise, all members exercise the right to use the different resources that are offered as incentives to the HRMS.

As discussed in the earlier section, the abilities of the HRMS to take care of the requirements of individual members and to ensure equal opportunity to them in all aspects of its functioning and decision-making and a share in the incentives, have defined its successful and sustainable existence. A very crucial element of its functioning has been the benefit-sharing arrangements.

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Conflicts

Introduction

Conflicts have arisen due to the complexity and diversity of stakeholders and stakes, both within villages and between/among societies. The origin and nature of conflicts is influenced by the socio-economic profile of the community, the functioning of the Hills Resource Management Society (HRMS), and the level of community participation in the HRMS deliberations. In several instances, conflicts over resource demarcation or benefit-sharing or utilization of funds also indicate improved understanding and increased involvement of people in all aspects of societal functioning. However, a large number of these conflicts have been resolved amicably as has been represented in the form of case studies from the field.

Forest area demarcation

A major source of conflict between villages and the HRMSs has been on the demarcation of the Joint Management Areas (Box 1). Most often than not, the HRMSs are created in villages based on their response to the idea of the Joint Forest Management Programme (JFMP) and the initiative they take in going through the procedures, apart from their stake and use of the forest area adjoining their village. Often, the adjoining villages, having observed the benefits to the HRMSs formed in the neighbouring villages, stake their claim in the forests and the produce, resulting in conflict between the existent HRMSs and the aspirants.

Institutional issues

Lack of transparency in financial transactions is one of the most frequent reasons for intra-HRMS conflict. Although the HRMS by-laws require that all decisions regarding the utilization of funds be taken by a majority vote in general body meetings (GBMs), the Management Committee (MC), sometimes, flouts this rule and conducts monetary dealings in the absence of a general consensus. There have been instances where transactions involving tens of thousands of rupees have been conducted with the knowledge of only the office-bearers of the Society. The members of the HRMSs have voiced their objections against such clandestine

Box 1. Inter-village conflict over forest use and management

Case

A conflict arose among four villages, namely, Khera, Basolan, Prempura, and Jattanmajri which were dependent on a particular patch of forest area, and were harvesting forest produce for years.

While all villages had traditional use rights in the forest area, an HRMS for the Jattanmajri village was formed in 1981/82 and the forest area was given on lease to them which functioned successfully in the first year. Following this, Khera, Basolan, and Prempura registered their grievance with the Haryana Forest Department (HFD), and, as a result, three new HRMSs were formed in these villages as well. These four societies were now given the responsibility of protecting and managing the said forest area jointly. Though the members benefited from the reduced *dati* rates for fodder extraction as compared to the high rates charged by the contractor, the system could not work for more than a year. There was a conflict of interests as different groups in the villages were dependent on different produce, i.e., the *Jats* on fodder grasses for livestock rearing and the *Banjaras* on *Bhabbar* grass for rope-making. Owing to their geographical location, not all forest area was accessible to all the four villages. There were instances of open grazing also.

Another problem faced by the villagers from the four HRMSs was that the forest department (FD) required the lease money for the forest area to be submitted as a whole and not in parts by the HRMSs. The lack of coordination among the HRMSs led to the open auctioning of the forest area by the HFD. The contractor not only increased the *dati* rates but also allowed open grazing, which resulted in deterioration of the forests. The next year, the contractor refused to provide *datis* and the villagers were forced to buy dry fodder.

This acted as catalyst for the villagers to come together and work out a system for resolving the conflict. They decided that the forest area could be divided between the four villages and they would independently manage the same. The claims of individual villages were rationalized in a joint meeting. The forest area was divided on the map based on the proximity to the respective village, the areas used traditionally by villagers, the established routes for produce extraction, etc. The system is in place and functioning well.

dealings, resulting in a conflicting situation between the office-bearers and the general body (GB) members.

Such conflicts have been observed regarding the following:

- sub-letting of *bhabbar* lease to private contractors for commercial harvesting, without holding an open auction, or without prior discussion at a GBM;
- auction of dam water to private contractors at sub-optimal rates; and
- sub-letting of grass lease to private contractors, resulting in the imposition of high rates for grass extraction per *dati*. A *dati* rate is the amount charged for extraction of grass from the forest for one season.

Sub-letting of Bhabbar

Conflicts regarding sub-letting of *bhabbar* and grass leases usually occur during August–October, the period when grass and *bhabbar* sprouts start appearing, and yield of grasses from the forest land can be reasonably estimated. Election time is another period of conflict, when the outgoing MC presents accounts of the previous year. Major expenses shown in annual accounts without the sanction of the GBM would also invite conflicts between the MC and the GB members.

Fund utilization

All decisions regarding utilization of funds, exceeding Rs 250, require the convening of a GBM for decision-making. However, this norm is not always followed and huge sums of money are sometimes put to undesirable uses. Funds are also sometimes invested in non-productive assets, without the consent of the majority. Examples of such uses include:

- amount shown against refreshments and other expenses incurred on entertaining prominent political figures upon their arrival at the village;
- personal travel and other expenses, above the permissible limit, incurred by office-bearers when out on work for the Society;
- lending of HRMS funds to some member(s) at abysmally low rates of interest for such social occasions as marriage of daughter; and
- unreasonably high expenses shown against any activity.

Dati *rates*

The rate levied per *dati* varies with the amount extracted per day—one headload or more. Prior to JFM, leases for fodder grass were purchased by private contractors from the FD, along with the *bhabbar* lease. In most instances, these contractors had little regard for the future productivity of forests because of a general lack of concern for forests in the long run. They charged exorbitant rates for *dati*; and even permitted cattle grazing in forests, towards the end of the *bhabbar* harvesting season, charging a sum calculated on the basis of the number of cattleheads grazed.

With the coming of JFM, village communities were given the first charge on forest produce, and forest management rights transferred to them. Individual HRMSs were given the right to purchase the grass lease for the forest area adjoining/surrounding their village. This phase saw a lowering of lease rates as the area was no longer subject to bidding at auctions. The lease amount for the first year for an HRMS is the average of the rates for the previous three consecutive years. Subsequently, the rate increases by one per cent every year.

The rate per *dati* is generally determined at a meeting of the GB convened prior to the commencement of the harvesting season. While in some HRMSs, the rate is determined logically, so that amount recovered more or less equals the cost incurred, in other cases the rates are arbitrarily set, either too high or too low. In most instances, very low rates are welcomed by a majority, and criticized by only those who feel that this practice would eat away into the savings and/or profits of the HRMS in the following year, when it would be time for the HRMS to purchase the lease from the HFD (Box 2). Very high rates, on the other hand, even when logically calculated, have been severely criticized, forcing the MC to lower the rates. Or, fewer *datis* are enlisted when *dati* rates are high, which effectively means that the number of beneficiaries is reduced and/or the benefits flow only to the economically well-off strata of the village community, who can afford higher *dati* rates.

Non-payment of dues

Non-payment of dues (water charges, *dati*, etc.) has also resulted in conflicts. After the election, the outgoing MC is required to hand over all the HRMS documents and records to the newly elected MC, with no dues outstanding towards any member of the HRMS, or any outsider. The outgoing MC is required to collect all outstanding payments prior to the election, which causes some friction

Box 2. Inter-HRMS conflict over *dati* rates

Case

In 1981/82, the villages of Surajpur, Rajipur, and Manakpur Nanakchand had a joint HRMS. The President of the HRMS, Mr Suchcha Singh belonged to M Nanakchand. He claimed that there had been a massive misappropriation of the Society's common funds by the previous office-bearers. He thus took a decision to allow all villagers to take fodder *datis* free of cost, as he was not sure whether the money when collected would be put to proper use. His argument was that the cost of the fodder grass lease would be comfortably met by the profit made through the sale of the *bhabbar* lease.

The villagers, however, felt that this kind of pricing would lead to the indiscriminate exploitation of the forest resources and area, with people from distant villages also coming in to harvest grass from the area.

Resolution mechanism adopted

A GBM of the HRMS was convened to internally discuss and debate the issue, and to evolve a commonly acceptable solution to the problem. It appeared that the conflict between the newly elected and the re-elected members of the MC was the result of a mutual lack of trust. In the broader context, the conflict was probably rooted between the two concerned villages—M Nanakchand and Surajpur. A proposition to separate the forest areas of the villages was considered as a long-term solution to the present dispute. In the interim, the following actions were resorted to:

1. the President, Mr Suchcha Singh was informed that because of the *modus operandi* adopted by him, the responsibility in the event of the destruction of the forest would be solely his;
2. the decision taken by the President to allow fodder harvesting free of cost was procedurally incorrect, as a decision of this nature, with manifold implications and a broad sphere of influence, required prior approval of the GB, whereas he had not even sought the approval of the MC; and
3. an appropriate price for the *dati* would be fixed by the GB.

between the non-payees and the office-bearers. The office-bearers have sometimes been known for forgoing *dati* dues from their relatives/close friends in the village, which also invites criticism from others, and, hence, conflict.

Power struggle

The democratic structure of HRMSs enforces equality, allows equal rights to all, and a fair distribution of benefits from common property resources. This, often, entailed changing of an established order, essentially one that allows for dominance by a certain section. The consequent loss of power wielded by the dominant section and loss of associated benefits and/or privileges, manifest in a resistance from this section, and it generally ends in a conflict between the losers and the gainers. Deprivation of a current user group or beneficiary, in interest of ecological concerns, also results in similar resistance or opposition, and non-compliance with newly imposed norms for protection, conservation, and/or management of the resource. Inequity in benefit-sharing is an issue which causes marginalization of a certain section, minority group, or the resource-poor, resulting in disharmony and discord.

Ambiguity in role definition

An unclear definition of rights and responsibilities of office-bearers and the MC and GB members leaves scope for manipulation and non-adherence, or neglect of duties and responsibilities, and improper exercise of rights. These reasons become potential causes for conflict between various right holders, and threaten successful functioning of the institution. Power struggle between the *Panchayat,* the local self-governance body existing in the village, and the HRMS is an example of rivalry between institutions functioning in parallel. Though this is seldom the case, because the HRMS is a non-political entity, and, generally, has representation from the *Panchayat,* and the MC of the HRMS is generally elected by consensus, the HRMS sometimes wields more power in terms of funds available with the institution for village welfare. Such a situation has been a source of conflict in village Salehpur where the HRMS and the *Panchayat* were at loggerheads with each other in 1996.

Benefit-sharing

Inappropriate benefit-sharing mechanisms also result in conflicts. In the case of water for irrigation supplied from small water-harvesting structures, the pressure, or rate of flow, diminishes as the water level in the dam lowers, and this cannot then be pumped to distant fields. When the distribution begins from the tail end, this problem can be avoided. However, if irrigation supply begins from the fields nearer the dam, distant fields do not receive any water, even though there may be enough in the dam for irrigation of all fields. When the distribution system is judiciously planned, there are no conflicts on account of the water distribution mechanism.

Discord may also arise if traditional rights of the user community are in conflict with the Society's mandate. The traditional user rights of village communities settled in/around forests in Haryana are not uniform. Nevertheless, the rules and regulations applicable to all HRMSs are the same. Therefore, norms of protection and management, with people's cooperation, are sometimes flouted, resulting in conflict.

Resource management and utilization

Conflicts over resource management arise when different stakeholder groups have differing management objectives. In the case of *bhabbar*, for example, juvenile sprouts may be consumed by cattle during the lean weeks in June when there is no other fodder available, except *tudi* (dry fodder) from the market. If, however, the same sprouts are allowed to grow till maturity, the fibre yield of *bhabbar* is higher, fetching a higher price in the commercial *bhabbar* market. It has been observed that the poorer/disadvantaged sections of the village community prefer using juvenile *bhabbar* as fodder, rather than buy *tudi* from the market. The richer land-holding class, however, in the hope of making greater monetary profit from the sale of the fibre grass, prefers buying *tudi* for the two/three-week period during June/July. Moreover, they can afford to do so, and insist that all Society members adhere to this practice. This was one of the bones of contention between residents of the hamlets of Sukhomajri and Dhamala during the year 1995/96, when they jointly shared rights and responsibilities for management of the grass lease. While residents of Dhamala restrained themselves from harvesting of juvenile *bhabbar*, the same was not true of Sukhomajri. This situation led to a conflict of interests between the two HRMSs.

Similarly, retention of a minimum level of water in dams allows for the practice of pisciculture, another source of income for the HRMS. The management of pisciculture is contracted, generally for a period of five years, to the highest bidder at an open auction. However, the entire water is sometimes drained out for irrigation, resulting in the death of the fish, non-payment of the sum agreed upon by the contractor, and subsequent conflict between the HRMS and the contractor.

The system adopted by the HRMS for management of the natural resources available to the village community is ideally decided upon at a GBM of the HRMS every year. Sometimes, though these important decisions are taken by a few influential persons, or office-bearers of the HRMS, and are met with mild-to-fierce opposition from the other members. The opposition is sometimes towards the system adopted for management, but more commonly towards the mode of decision-making, accompanied with non-conformity to established norms of management. In the case of management of *bhabbar*, for example, the HRMS may manage the lease itself, employing labourers for extraction, sub-contract it to one or more members of the HRMS for management, or further sub-let it to private contractors. If the decision is taken without a majority vote at a GBM, there is usually a conflict at a later date when the members express their discontent with the mode of management and/or decision-making. Similarly, when the grass lease is further sub-let to a private contractor, the rates of *dati* levied on the users are far higher than what they would have been if the lease were managed by the HRMS itself. This conflict is more likely to occur if the decision-makers and the affected party have different stakes and interests. Decision-makers are sometimes not as dependent on fodder from forests as the other members of the Society are. And, in pursuit of their own interests, they end up taking decisions that adversely affect the majority, which result in conflicts. The conditions agreed upon in the system adopted for management of the lease may also prove to be a source of conflict.

The layout of pipes for distribution of irrigation water is usually a joint exercise conducted by the villagers and the local Forest Guard (FG). Because of paucity of funds, limited number of pipelines, and even limited water in the dam, there is the possibility of a conflict between different sections of the village, over the layout of these pipelines. In the absence of technical expertise on this matter, views of the villagers and the FG are the only basis to go by, and these become the precipitating factors for conflicts between factions with opposing plans.

The villagers are also sometimes in conflict with the FD field staff over the control and operation of the sluice valve of dams, which regulates the outflow of water. For fear of the spillway breaching in because of an excess of water outflow over it, the FG sometimes opens out the sluice valve, resulting in the accumulation of only a small volume of water in the dam. When the villagers realize what has been done, there is usually a conflict between them and the FG.

Sociological issues

The democratic structure of the HRMS as an institution confers on the members equal rights of decision-making, execution of decision(s) taken, and benefit-sharing. Prominent opinion leaders in villages, sometimes, feel threatened because of a perceived loss of power resulting from a decentralized/democratic decision-making process. This perception, in turn, erects walls of resistance against the new set-up, unwillingness to abide by the decision(s) taken by the majority, and consequent conflict.

The perception of loss of power and authority is not limited to the village opinion leaders alone; officials of the FD are also similarly affected by the HRMS set-up, and many even fear that participation of people in the management of forests would ruin even the vegetation currently existent. Such apprehensions are generally rooted in insecurity, and workshops on attitudinal reorientation have proved useful in overcoming such mental blocks against implementation of the programme.

At the time of purchase of *bhabbar* and fodder grass lease, certain poorer sections of the village community are unable to contribute money towards purchase of the leases, as that time of the year is a lean period and income from other sources is insignificant. Often, the contributions come from a select few households that are generally well-off, resulting in the marginalization and domination of the non-contributing households. Sometimes the 'favours' granted to these poorer families are compensated for by engaging members from such families in agricultural labour on the fields of the big landowners. When there is resistance against such exploitation, there is usually a conflict.

Differences in understanding and/or interpretation of rules and regulations, or conditions agreed upon earlier may also lead to conflicting situations between two or more parties. This is normally so when the by-laws of the HRMS are not properly understood, particularly with respect to monetary dealings, and also with regard to the conduct of elections for formation of the MC. Such conflicts also occur between the HRMS members and the private contractors over conditions of sub-letting, or grass/*bhabbar* extraction norms agreed upon at the time of the auction.

Suspicion regarding the honesty of office-bearers of the HRMS, among the GB members of the HRMS, fired by a lack of transparency in monetary transactions, often leads to polarization and factionalism in the village community. This causes a generalized opposition of all suggestions originating from any one faction, impaired decision-making, disputes over all possible aspects, and further polarization. Such factionalism may also be a result of non-election to a position of power in the earlier held *Panchayat* elections, followed by non-compliance with the Society's rules and regulations.

Conflict between the HRMS and the HFD

There have been reasons for conflict between the FD and the villagers who extract produce from the forests (Box 3). Among the greatest successes in bridging the gap between the two parties and creating a cordial working relationship has been the partnership developed between the *Bhanjadas* and the HFD. Residents of the bamboo-dependent societies of Kalka and Bargodam are allowed extraction of 100 bamboo culms every month for nine months in a year, except during July–October, when bamboo shoots emerge. Flouting of these and other bamboo extraction norms, e.g., harvesting of *manus* (one-year-old bamboo culms) also causes conflict between the local FG and the HRMS members.

In these societies, the FG also complains of non-cooperation from villagers in the event of a fire, extraction beyond the permissible limit, non-cleaning of old bamboo clumps, destructive methods of harvesting, and harvesting of *manus*. The villagers, on the other hand, complain of harassment by the FD officials for issuance of bamboo extraction permits to individual households. Residents of the these villages also complain of the engagement of labourers from other villages for extraction of bamboo culms from the adjoining Reserve Forests.

Box 3. HRMS–HFD conflict

Case

A major complaint of the villagers of Harijan Nada was that the FG did not take any action against persons who practise illicit felling in the plantation, despite timely reports by the HRMS members. The FG, however, immediately pointed out that when the HRMS issued felling permits to individuals, he was not informed. Often, when the FG caught somebody felling a tree from the plantation, that person would show him the felling permit issued by the HRMS.

Resolution mechanism adopted

It was resolved at the GBM that:

1. permits would be issued in three copies—one copy to be retained by the Secretary of the issuing HRMS, the second copy to be given to the person who has requested a permit for extraction of timber, and the third copy to be sent to the FG;
2. permit holders would practice felling only on particular days of the week, allowing the FG to closely monitor all felling activities.

Gender Issues

Introduction

Gender is a social and cultural construct. Roles, relations, and equality are among the different facets related to the gender construct. Gender roles define how women and men perform different tasks for the household, earn income in different ways, have different levels of control over their respective incomes, allocate time differently, have different legal and traditional rights, and possess different types of knowledge. Gender relations are an aspect of broader social relations and, like all social relations, are constituted through the rules, norms, and practices by which resources are allocated, tasks and responsibilities are shared, values are assigned, and power is mobilized (Kabeer, Subrahmanian 1996). Gender equality has a lot to do with gender roles and relations. Strategies which facilitate long-term changes in gender relations based on more equal distribution of resources and responsibilities, as well as power and authority between men and women, and between men from different sections of the society are attempts to achieve gender equality.

While discussing women, as the term gender has come to connote, in the natural resources context, it is observed that women are highly constrained by the limited (and declining) resources and means at their command—a constraint that stems not merely from their class position (like in the case of men) but also from their gender. These gender inequities in their access to resources take varying forms such as; intra-family differences in the distribution of basic necessities; women's systematically disadvantaged position in the labour market; their little access to the crucial means of production—land, and associated production technology; and the growing deterioration and privatization of the country's common property resources on which the poor in general, and women in particular depend to a substantial degree for sustenance (Agarwal 1989).

While the Indian society, to a large extent, is iniquitous where gender relations are concerned, this section only deals with women and their relation with natural resources, in the specific context of Joint Forest Management (JFM). In an environment of iniquitous gender relations, it is essential to ensure women's equitable access and entitlement to the produce of public forests which are central to

JFM, through appropriate and adequate representation in local institutions, their working and decision-making processes.

Status of women

The status of women in the households of rural society in India is not consistent with their contribution to household management or even family income. Besides the traditional tasks linked to their domestic responsibilities, there is a division of labour between men and women, and between women themselves based on caste. As women have always had to play the role of managers, arranging for cooking fuel and fodder for livestock, it is they who suffer the most from the consequences of environmental degradation, and the resultant shortage in the yield of fodder, fuelwood, water, etc. The involvement of women in agricultural activities varies with economic status of the household and caste in the rural milieu. Women in large land-holding families are mostly involved in livestock rearing; those from the marginal landowning class are involved in agriculture, apart from livestock rearing. But the degradation of the natural environment, particularly through the destruction of forests, and a rapidly shrinking resource base has had its impact on the status of rural women in general, irrespective of caste status.

For women to become meaningful partners in the management and use of resources, the basic issues that need to be addressed include their access to and control of natural resources, knowledge, information, decision-making systems, and the products of their own labour. Further, their participation in any programme would involve the right and opportunity to take part in decisions affecting their lives and livelihood. On the other hand, informed decisions require access to information, developing the capability to analyse it from one's own perspective, and awareness of alternative options. In spite of the disadvantageous position that women generally are in, the diversity among women, between rural and urban women, and between different classes of rural women, prevents all women from being clubbed together.

No doubt there are common problems and characteristics that all women might share, but equally, there are significant differences in priorities, consciousness, and roles of women across classes and regions (World Bank 1991). There is a need to understand and acknowledge gender differences in access to and control over resources in relation to gendered responsibilities, and how these are perpetuated through social institutions. Therefore, the problems and opportunities unfolded by any project or process like the Joint Forest Management Programme (JFMP), do not affect all women in an equal manner, even in the same regional and cultural context.

Women in the Haryana JFMP

Haryana is primarily an agricultural state with nearly 83% of its geographical area under cultivation. 7.9% of the total area of the state is under tree cover, of which nearly 4% is of commercial plantation. Of the remaining 3.9% of natural forests, nearly 25%–29% is in the Shivalik belt. Thus, whereas the entire state is largely dependent only on agriculture, it is only along the Shivalik belt that the user communities have a significant dependence on both agriculture as well as forest resources.

In a majority of Haryana villages, collection of fuel, fodder, and water for household consumption defines the role of women and their relationship with natural resources. Yet, there are women who also play an equal role with men in sustaining their livelihood or economy, which is forest-based (Kanetkar, Varalakshmi 1994). Women in the Shivalik area have a very important and delicate relationship with natural resources wherein their economic, social, and ecological/environmental contributions are critical for sustainable development and utilization of these fast depleting and degrading resources. All village women in the Shivalik area are dependent on forests, both directly and indirectly, though with a variance in the degree of dependence. What is also true is that women have a key role to play in both land-use and management, be it crop land or forest land, on which they are dependent.

Policy interventions

The policy of Government of India (GoI) for making development, gender sensitive, increasingly emphasizes qualitative inputs, focusing on inculcating self-confidence among women; generating awareness about their rights; and training them for economic activity and employment (GoI 1988a). When the policy initiatives for the inclusion of women in forestry programmes are traced, the 1988 Forest Policy, which talks about 'creating massive people's movement with the involvement of women for achieving the policy objectives', is the first attempt (GoI 1988b). However, the Haryana state JFM resolution did not have any specific provision for the involvement of women, nor did it provide the space for their participation. The required changes and provisions were, however, incorporated in the by-laws framed for the societies.

One man and one woman from each household would be members of the village-level institution called the Hill Resource Management Society (HRMS), and this membership has subsequently been opened to all interested adults in the village with the hope that, since women are more intimately involved with forests, the number should not in any way constrain their involvement. The Management Committee (MC) elected annually in the general body (GB) meeting has seven to nine members, and at least two members have to be women. In villages where women are actively involved in the collection, use, and processing of forest produce for income generation, their representation is proportionately higher. There are instances where the number of women in the MC is more than men and in a number of villages women are also office-bearers.

Though the policy of the Government of Haryana does not feature these aspects of membership and women's involvement, these aspects are being incorporated in the JFM rules that have been submitted to the Government of Haryana for approval. Meanwhile, with the HRMS being registered societies, the by-laws adequately provide the legal backing for the women's participation.

Factors inhibiting women's participation

Women's equal and active participation in the HRMS, which is a community institution, MCs and the decision-making processes, pose the challenge of changing cultural attitudes, norms, and traditions, and dealing with the constraint of their exclusion from such fora for ages. In this context, the reach of different projects is limited or negligible where women are concerned, except in the field of maternal and child health, and perhaps children's education.

In such an atmosphere, the success with the involvement of women from every household in the HRMS and its different processes is commendable. Membership of MC involves participation in higher-level decision-making, being in a leadership role, acquiring a higher social status within the community, gaining greater access to information and decision-making experience, greater exposure to outsiders and different world views, and an opportunity to negotiate and lobby for the interests of the sub-group or section of the membership one represents (Sarin *et al.* 1996). This might be a tall order for most women with their poor education and exposure, and the restrictive environment.

Thus, it is crucial to address the multiple constraints inhibiting women's equal participation in JFM. The stability and effectiveness of JFM groups is rooted in equitable sharing of costs and benefits among members, consensus-based decision-making, and the capacity to enforce agreed upon access rules, primarily through social pressure and control, with women very much an integral part of the system.

Strategies adopted for enhancing participation

With experience which included some successes and failures, the implementation team evolved certain strategies. Meetings, which are an important medium/forum for reaching the women, were scheduled preferably in/near the villages, and at times convenient to both men and women. Time scheduling is done by consensus, and the information regarding the meeting, date, time, and agenda is spread by a public address system in most villages, and by the circulation of the register containing the information through the Forest Watcher by the Forest Guard, wherein each member signs an acknowledgement. This ensures good participation and a quorum made up of both men and women. Further, the Support Team ensured that there were women in the team, which helped women to attend meetings, and, in fact, facilitated the process by reflecting that women's involvement was valuable and appreciated.

Also, separate meetings are held with women to discuss issues and aspects of the programme that affect women the most, apart from other issues. These issues are then brought and discussed in the open/general meetings, and solutions are sought from the house. This process has helped men understand and appreciate the impact of the programme on women. Separate meetings are also held with women from different sections of the village based on the understanding of differential dependence of different caste groups on the forests. This strategy of holding separate meetings with women is proving to be an effective method of understanding women's different needs and priorities, and striving for their more meaningful participation in decision-making.

A number of training programmes have focused exclusively on women, both in their spirit and attendance. As part of the farmers' training programmes, which the support team is conducting on behalf of the Haryana Forest Department (HFD), and other training programmes conducted as part of the larger programme, only for women, and for both men and women, equal participation of women is ensured by the HFD and the support team. Among the issues discussed in these programmes are the concept of JFM, the HRMS, and the MC, their membership in terms of men and women, the quorum for meetings to include women in considerable number, the roles and responsibilities of individual members, etc. These are fora for educating not only women but also men regarding the role of women in the JFMP.

To quantify, to some extent, and also to reflect upon the success of the strategies and efforts pursued as part of the JFMPs, where women were concerned, small studies have also been carried out. The main findings of one such study are presented to understand the involvement of women better.

Role of forest departments

Being state agencies, forest departments (FDs) are in the advantageous position of introducing progressive changes in traditional attitudes, practices, and organizational norms by insisting that priority is given to gender and equity concerns, both in the management priorities for JFM and in the structure and functioning of the local institutions participating in the programme (Sarin *et al.* 1996). The HFD was able to breakthrough the barriers preventing women's participation owing to some dedicated staff, both men and women, and external facilitating agencies. Further, the support team's composition and mandate provided the requisite support and guidance to strengthen the department's efforts.

For the creation of legitimate space for women in the HRMS, conscious effort is on to minimize the danger of women's gender needs being overlooked. In fact, a process has been initiated through which a traditional, all male, often elite-dominated, community institution is progressively being transformed. The HFD's firm insistence on the precondition of women's independent eligibility, combined with the insistence on their presence in village meetings, has had the beneficial impact of raising male awareness about the state's commitment to gender equality. In addition, it has not only made the village men accept the principle of equal participation of women in HRMSs, but also involved them in inviting women to the meeting. Facilitation of women's participation, has to be based on such location-specific understanding of needs.

Role of external facilitators

External facilitators can empower forest-dependent women and marginalized communities to gain a voice in community decisions, by facilitating development of more equitable and alternative management options, based on disaggregation of local needs of gender and socio-economic status. Among the common constraints preventing women from attending village meetings include lack of prior intimation or knowledge about meetings, timing of meetings, location of meetings, social and cultural constraints, lack of appreciation of relevance, and usefulness of meetings. All this has been reversed by consciously putting systems in place for keeping women equally informed and involved.

Case study

A detailed situational analysis of four villages, namely, Kalka and Kahinwala, (where women are directly dependent on forests for their livelihood) and Masoompur and Lohgarh (where subsidiary activities are taken up by women based on forest produce) was carried out (Varalakshmi 1993). The study revealed that there has been a remarkable impact of involvement of women in JFMP on the lives and livelihood in these villages. Table 1 provides a brief summary of the four villages in terms of the benefits accruing to the villagers, in general, and women, in particular.

Benefits

In homogenous villages of Kalka and Kahinwala, the entire population has an intimate relationship with the forest. The people in these villages are traditional craftsmen, who make baskets and rope. The status of forests and the easy availability of forest produce at concessional prices have had a tremendous impact on their earnings and living. The impact of the incentive provided in the form of bamboo at concessional rates, with longer duration of availability, and *bhabbar* at reasonable price, can be quantified, to some extent. It is, thus, possible to say that the earnings of the *Bhanjdas* increased on an average by 54% (Varalakshmi 1992). The *Banjaras* also increased their earnings by 26.2% (Vijh, Arora 1993) when they took the forest area on lease and harvested *bhabbar* as compared with when they bought *bhabbar* from the contractor. More importantly, the benefits of incentives for women can be analysed considering that women, in particular, are major beneficiaries, and that they, being the main party, are engaged in the process of producing these products, which are then marketed by the menfolk.

Table 1. Comparison of the study villages

HRMS (Status)	Type of dependency (forest products)	Society formation	Responsibilities of the Society	Benefits to the Society	Benefits to women
Kalka (functional)	Bamboo, fuelwood	1990	Protection of forest area against fire and cleaning of clumps after bamboo harvesting	100 Bamboo at a concessional rate of Rs 15; for nine months (October–June) in an year	Employment from bamboo basket-making available for nine months in a year and bamboo waste used as fuel
Masoompur (functional)	Fodder, fuelwood, irrigation and drinking water	1987	Management of *bhabbar* lease, protection of forest area from grazing and illicit extraction, distribution of irrigation water from dam, maintenance of the dam and protection of dam catchment	Fodder for livestock, *bhabbar* for commercial sale, supplemental irrigation water, fuelwood in the form of dead and fallen wood	Fodder for livestock, drinking water for cattle and domestic consumption, fuelwood
Kahinwala (defunct)	*Bhabbar* and fodder grass, fuelwood.	1985	Management of *bhabbar* lease, Protection of forest area from grazing and illicit extraction of forest produce	Availability of *bhabbar* grass at concessional rate, fodder grass and fuelwood availability	Large quantities of *bhabbar* available for making rope, fodder and fuelwood available without much difficulty
Lohgarh (functional)	Fodder, irrigation water, fuelwood, *bhabbar* grass.	1985	Protection of forest area from grazing and illicit extraction, distribution of irrigation water from dam, protection of dam catchment, management of *bhabbar* lease	Irrigation water, revenue from sale of *bhabbar*, fodder grass and fuelwood availability	Fodder grass for livestock, fuelwood availability, supplemental water for irrigation

In the other two villages, Masoompur and Lohgarh, which have heterogeneous societies, there has been a range of benefits to the various castes. The benefits of incentives like irrigation water are restricted to land-holding families, fodder and fuelwood being major requirements of all the caste groups. Thus, the benefits accruing to the village women varied based on the caste groups to which they belonged. The women from the lower castes are seen to fetch fodder and fuelwood from the forests themselves, whereas the women belonging to the higher caste do not go to the forests, but have the responsibility of bringing fodder from the fields and also of maintaining large livestock holdings.

The *Harijans*, in the absence of their own agricultural land, are dependent on forests for collecting the fodder for their livestock. On the other hand, the *Jats, Jhimars*, and Hindu *Gujjars*, who have larger livestock holdings, also need fodder from the forests, to supplement their requirements, most of which are met from other sources. Though fodder from the forest is brought by men, women harvest fodder from crop fields. With good quantities of fodder available from the forest, good quality grass is available throughout the year, and this enhances the quality of milk as well as the realizable price. The difference between the different castes is in the degree of dependency. Though the water for irrigation has restricted use, dam water is the main source of drinking water for livestock and for domestic consumption of the entire village. These benefits cannot be calculated and quantified without imputing a lot of values for the increased milk production, the increased agricultural production, etc. What is, however, possible, is to look at the efforts and time saved by women from these benefits. The qualitative impact is an important parameter which can help assess the indirect benefits to women as these incentives have had a definite and positive effect on the lives of women.

Lessons

Development interventions concerning women and resource management may fundamentally be divided into two types: high investment programmes that marginalize women and women-specific programmes that are themselves marginalized (Pradhan, Rankin 1995). The high investment and technology base of programmes exclude the less informed women, while those programmes that focus on women but have little support and appreciation from other sections, prevent their integration into the mainstream of development. The high investment programmes, however, are incapable of accomplishing sustainable resource management in the absence of involvement of all stakeholders. The high investment programmes only worsen the situation between households and resources, wherein local management systems get disrupted and the inequilibrium prevalent in society intensifies. Women-specific programmes, by virtue of their narrow concentration or focus, only look at issues of maternal and child health, education, and other development programmes, but have little to do with women in relation to their dependence on natural resources.

The JFMP, on the other hand, recognizes the delicate relationship between forest resources and their role in the livelihood of villagers, especially women whose entire life is intricately linked to, and governed by, the natural resource status. All through the different phases of the development of this programme, special strategies were and are being evolved, tested, and modified, to obliterate all traces of gender-biased development. Typically, JFM in Haryana has followed an area strategy, wherein flexibility to respond to locally-identified concerns/circumstances is inbuilt. The programme evolved, thus, to incorporate the concerns and needs of women in the programme area. The involvement of women in the whole process is seen to not only improve the project effectiveness and sustainability, but also for the allocation of resources and diffusion of politica power, among women and the weaker classes.

In all the JFM villages, women are members of the Society and also representatives in the MC. The attendance of women at the Society meetings and their involvement in the decision-making process are now noticeable, but to say that women have never influenced decisions would also not be correct. Certain cultural barriers and traditions prevent women from speaking out openly at meetings, and these should be respected. However, periodical meetings with women help in eliciting their views, opinion, and their understanding of the programme.

The programme has been successful in strengthening the role of women in influencing decisions regarding forest and other resource management. Women have been sensitized and strengthened, and are now in a position to express their opinions forcefully and effectively, both on village and household level issues, and, thus, influence the village position on certain issues. Women are not only aware of the difference in the resource availability in the programme and non-programme period, but are also concerned about the sustainability of the resources and the need to maintain them for their progeny. To that extent, the programme has been successful in really involving women.

The experience with women is indicative of the need to desegregate natural, including forest, resource users into their constituents like caste, class, and gender, and design appropriate strategies to empower these groups to be able to decide about issues, and effectively implement programmes that affect their livelihood and long-term security, without which participation cannot be achieved (Pradhan, Rankin 1995).

Conclusion

Forests provide the means of sustenance, directly and indirectly, to the villages in the foothills of the Shivaliks. The crucial question is, 'according to whose relative valuation of the different incentives and benefits of the programme, the actual success of the programme would be decided'. One clear indication for the success of this programme is the benefits derived by women of the village by participating in JFMP. Their membership in the HRMS and its MC and attendance at the GB meetings are obvious and evident criteria to assess women's participation in the programme. The more important parameters for such an assessment are the subtle ways in which the lives and livelihood of women have been affected, the awareness that women now have about benefits that have accrued to them from this programme, and the efforts they wish to make to maintain the sustainability of these resources for their progeny (Varalakshmi 1993).

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Programme Impacts

Forests have several uses, often competing with each other. They are becoming increasingly degraded and scarce with each passing day, owing to pressures. Fortunately due importance is being given, at last, to the role of locals living in and around forests, and dependent on them for fodder, fuel, etc., in the rehabilitation of these forests. This is in the wake of the forest departments' (FDs'), the traditional custodians of the forests, inability to police and protect these forests all by themselves. Joint Forest Management (JFM) has brought them together in order to achieve the goal of forest protection and regeneration with greater cooperation and synergy forthcoming from the two quarters.

Forestry is a regime of actions by which people in general (including the FD) conserve, augment, modify, and replace features of the forest so as to perpetuate its desired qualities, whatever these may be. With time, forestry has emerged into a social process rather than a forest condition. JFM is slowly emerging into a form of sustainable forestry which augments this regime with processes for rapid adaptation to changes in what people need, want, and can do. As an adaptive social process it is striving to create sufficient future forest opportunity to satisfy potentially competitive/conflicting interests that would diminish the forest if left unresolved. JFM thus faces the challenge of developing social processes that recognize, accommodate, and respond more effectively to diverse and dynamic perspectives of what the forest is and should be about.

However, for sustaining the forest ecosystem in Haryana, the management practices adopted fall within the intersection of three spheres of ecological viability (environmentally sound), economic feasibility (affordable), and social desirability (politically acceptable). Efforts have been made to maintain the balance among the three criteria in order to achieve the desired conditions for the forest resource. The Joint Forest Management Programme (JFMP) in Haryana has been able to achieve the desired balance, and the programme's success is reflected in the improved status of the forests, the socio-economic status of the people, and the strength of the institutional process of cooperation between the Haryana Forest Department (HFD) and the Hill Resource Management Societies (HRMSs).

Ecological impacts

The ecological impacts of the JFMP under implementation since 1990 in Haryana in the Morni-Pinjore and Yamunanagar forest divisions are evident. The effect of increasing years of protection is seen on various forest and ecological parameters such as grass productivity, tree count, basal area, and regeneration of trees and shrubs. The results are indicative of definitive trends with regard to various parameters and different years of protection in spite of certain variations in the site conditions of the forest areas. While the soils in Morni-Pinjore Forest Division are mostly sandy, those in the Ambala Forest Division are deep alluvium in the valleys, and sandy loam in the hills. Soils on the ridge along the Himachal Pradesh border (Ambala Forest Division) are red clay. Due to remoteness of the area and better soil and moisture conditions, forests in Ambala Forest Division are much varied in species composition and have a better growth.

Site conditions in the two forest divisions being very different, the type of vegetation and tree stocking also differ. In Morni-Pinjore Forest Division, the more xerophytic conditions have led to the predominance of various *Acacia* species and such shrubs as *Dodonae* and *Lantana*, whereas mesophytic conditions in Ambala Forest Division have favoured *chhal, sain, sal,* etc. Accordingly, the figures of growing stock for Morni-Pinjore and Ambala forest divisions vary, and are 26.55 and 73.25 m^3/ha, respectively.

Bhabbar ***and fodder grass***

A study was undertaken in the programme areas to understand the correlation between protection and grass production (both *bhabbar* and fodder grass). The results of air-dry and oven-dry measurements are presented in Table 1. On the basis of these results, the yield of *bhabbar* and other grasses has been worked out for areas representing different histories of community protection.

Table 1. Green- and dry-weight (g) proportions for *bhabbar* and other grasses

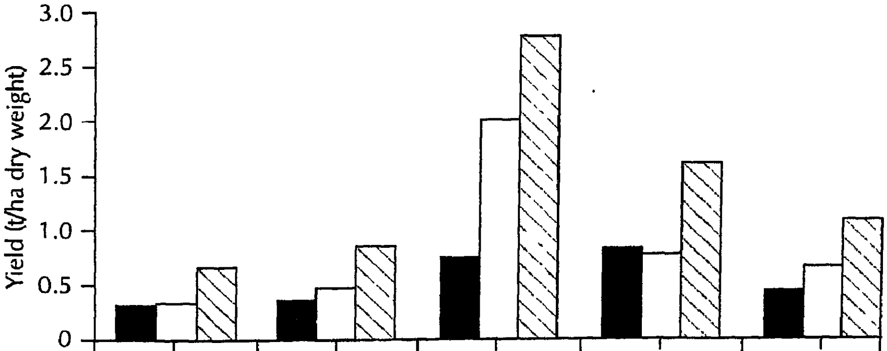
Protection period (years)	*Bhabbar* grass				Other grasses			
	Green weight	Air-dry weight		Oven-dry weight	Green weight	Air-dry weight		Oven-dry weight
		(1)[a]	(2)[b]			(1)[a]	(2)[b]	
0	1000	780	780	732	1000	750	750	695
0	1000	650	650	605	1000	600	600	563
1	1000	750	740	700	1000	740	720	668
3	1000	850	820	767	1000	850	800	757
6	1000	550	550	519	1000	600	600	565
10	500	300	300	280	500	300	300	281

[a] weight after 15 days; [b] weight before taking oven-dry weight.

Maximum average yield of *bhabbar* grass was found to be 0.85 t/ha (oven-dry weight for the area) under community protection for six years. However, the total yield of *bhabbar* and other grasses was maximum (2.8 t/ha) for the area protected for three years. The yield of both *bhabbar* and other grasses was found to be minimum in totally unprotected areas, with the average yield of *bhabbar* being 0.30 to 0.36 t/ha and that of other grasses being 0.30 to 0.38 t/ha. *Bhabbar* and grass yields were significantly low in the tenth year of protection as compared to their respective maximum yields in the sixth and third years (0.85 t/ha for *bhabbar* in the sixth year and 2.03 t/ha for other grasses in the third year). Figure 1 represents the trend and actual average grass yields for different years of community protection, respectively.

These yield figures represent average yields of the various samples. Due to extreme variations in the site conditions, the dispersion of yields amongst various sampling units was quite significant; the standard deviation, in some cases, being almost 100% of the sample mean. However, the value of standard error for total yield for the various compartments varied from approximately 7%–19%, the average value being 12.75%. In field surveys involving extreme heterogeneity of site conditions, a standard error of up to 20% is admissible. The results obtained in the present study can, therefore, be taken to be reliable.

The major contribution towards high standard deviations was from sampling units with little or no yield. This was a consequence of the concerned plots falling on bare cliffs, areas infested with *Lantana* or areas with significant canopy cover. The percentage of area with absolutely no yield at all, which might be called nil zones, has varied from 0 to nearly 19% of the different compartments under study. Comparison with yield figures after excluding nil zones showed



	Zero	One	Three	Six	Ten
■ *Bhabbar* grass	0.33	0.38	0.77	0.85	0.45
□ Other grasses	0.34	0.48	2.03	0.78	0.67
▨ Total	0.67	0.86	2.80	1.63	1.11

Period of community protection (years)

Figure 1. Average yield (t/ha) of *bhabbar* and other grasses under community protection

that the values of standard deviation for different study areas were considerably reduced. However, there was no appreciable change in the overall yield figures. Table 2 summarizes the yield estimates of the study area.

The factors influencing the absolute certainty of yield estimates presented in Table 2, besides sampling error, are as follows.

- Harvesting of *bhabbar* grass in a limited area of at least one compartment
- Shading effect of *Acacia catechu* trees in areas under *khair* plantations
- Aging of *bhabbar* tufts
- *Lantana* infestation in certain areas
- Low rainfall in the current season

Nothing can be done regarding the above factors so far as estimation of grass yields is concerned. However, in view of the sampling error, the reliable minimum estimate of *bhabbar* and grass yields, at a level of significance of 0.05%, is presented in Table 3.

Table 2. Yield of *bhabbar* and other grasses (t/ha) under community protection

Protection period (years)	Weight of *bhabbar* grass		Weight of other grasses		Total weight of grasses	
	With nil zones	Without nil zones	With nil zones	Without nil zones	With nil zones	Without nil zones
0	0.30-0.36	0.33-0.38	0.30-0.38	0.32-0.38	0.60-0.73	0.63-0.75
1	0.38 (115.1)	0.31	0.48 (109.1)	0.49	0.86	0.92
3	0.77 (233.3)	0.78	2.03 (597.1)	2.03	2.80	2.80
6	0.85 (257.6)	0.89	0.78 (229.4)	0.81	1.63	1.69
10	0.45 (136.2)	0.46	0.67 (197.1)	0.68	1.11	1.14

Note. Figures in parenthesis represent percentage increase as compared to the zero year plots.

Table 3. Reliable minimum estimate of *bhabbar* and grass yields (t/ha)

Period of protection (years)	Yield		
	Bhabbar grass	Other grasses	Total grasses
0	0.17	0.18	0.41
1	0.18	0.30	0.54
3	0.55	1.71	2.39
6	0.53	0.60	1.22
10	0.28	0.46	0.80

It can be observed from the above table that the reliable minimum estimate for yields of both *bhabbar* and other grasses maximize in the third year, being 0.55 and 1.71 t/ha, respectively. The year of maximum yield for *bhabbar* grass is reduced from the sixth year (when considering average values) to the third year (when considering the reliable minimum estimate). Thus, at a confidence level of 95%, the reliable minimum yield of *bhabbar* and other grasses was found to be 0.55 and 1.71 t/ha, respectively, representing maximum yield in three years of community protection, and being over three and nine times the yields of *bhabbar* and other grasses, respectively, in the unprotected areas.

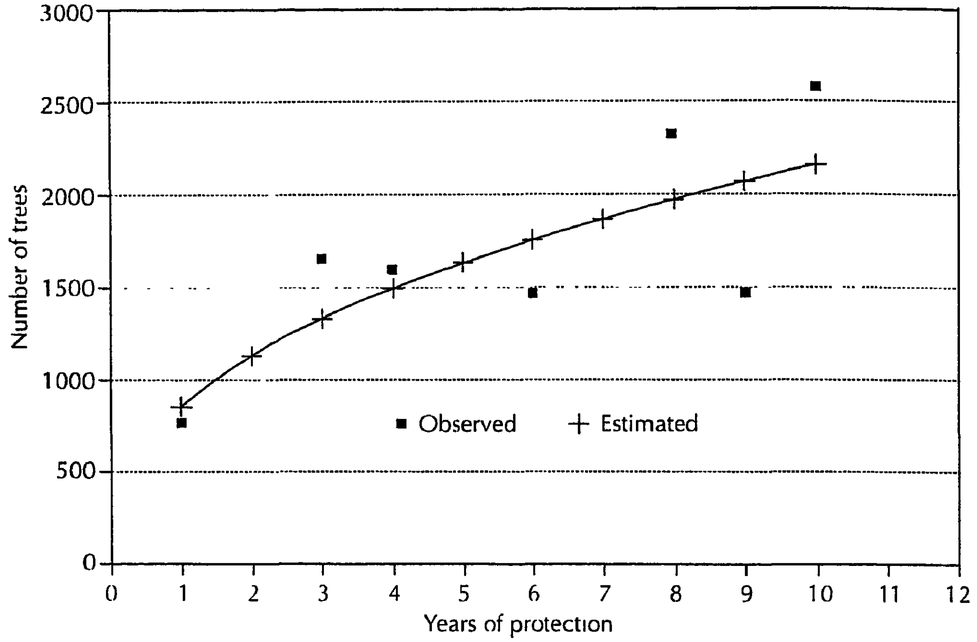
In another study conducted covering both villages in both Morni-Pinjore and Yamunanagar forest divisions, the maximum average yield of *bhabbar* grass across the two forest divisions was found to be 0.85 t/ha (oven-dry weight) from community protection of six years. Among the reasons for variations, across forest areas, in the yield of *bhabbar* are, the hilly cliffs, non-uniform harvesting of grasses from the same forest area, shading effect of *Acacia catechu* trees in areas under 'khair' plantations, aging of *bhabbar* tufts, and *Lantana* infestation in certain areas.

The reliable minimum estimate for yields of both *bhabbar* and other grasses maximize in the third year, being 0.55 t/ha and 1.71 t/ha, respectively. The year of maximum yield for *bhabbar* grass is reduced from the sixth year (when considering average values) to the third year (when considering the reliable minimum estimate). With the introduction of protection through JFMP in these areas, the yield of *bhabbar* increased to 233.3% and 257.6% in the third and sixth year of protection, respectively, as compared to the 'no protection' areas.

Tree population

The stocking of trees by 30-cm diameter classes shows that the number of trees/ha, both in different girth classes, as well as the total, has progressively increased with increasing years of protection, with certain variations. The total number of trees/ha varies from a minimum of 700 in unprotected forest areas to a maximum of 3960 in case of 10 years of protection. The maximum number of trees/ha is in girth class 5–35 cm, followed by 35–65 cm, which reflects the status of natural regeneration of these areas as a result of effective protection, mainly through profuse coppice shoots. In all these areas, trees in higher girth classes are fewer, indicating that the period of protection is too short for the trees to have progressed from lower to higher girth classes.

Ambala Forest Division has better edapho-climatic conditions than Morni-Pinjore Forest Division, a fact reflected by the higher tree density in the former division for the same period of protection; for example, Paniwala (Ambala Forest Division) has a density of 1870 trees/ha as against 1199 trees/ha in Gobindpur (Morni-Pinjore Forest Division), both with four years of protection. Taking the average values of tree population/ha for different periods of protection, it is observed that there is a positive correlation between these two variables (Figure 2).



Note. $Y = e^{[0.4065 \ln(x) + 6.7574]}$; $R^2 = 0.72$

Figure 2. Number of trees with years of protection

Species dominance

Almost all the forest areas in Morni-Pinjore Forest Division exhibit single species dominance (contribution of over 30% or more towards the total basal area). Relative inaccessibility is possibly the reason for the occurrence of mixed tree cover. Pure forests, where a single species accounts for 75% or more of the basal area, are found only in Molewali (78.42%) and Lohgarh (81.42%), both having *Acacia catechu* as the dominant species.

In over 45% of the forest areas, the single dominant species is *Acacia catechu*. This is primarily because the HFD has been raising the plantations of this species over years in the Shivalik region. Further, although the basal area contribution of the dominant species increases generally with increasing years of protection, there is no relation between different histories of protection and either the species dominance or the basal area contribution of the dominant species. Presumably, it is too early to expect any change in the degree of species dominance, which might be distinctly observable with progressive protection over a longer time-frame. At present, however, the occurrence of dominant species and their extent of contribution appear to be site-specific, and bear no relation to the number of years of protection afforded by the HRMS.

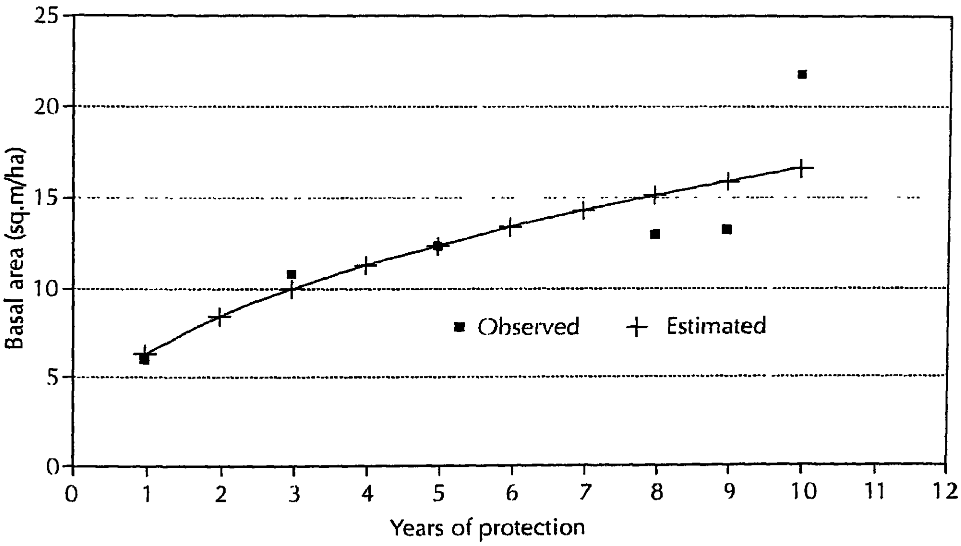
The red-clay soils of Ambala Forest Division support mesophytic species as *Anogeissus latifolia, Terminalia alata, Ougeinia oojeinensis,* and *Syzygium cumini;* some areas show a fair representation of sal and mature to over-mature chir pine (*Pinus roxyburghii*). Here again, as in Morni-Pinjore Forest Division, species dominance as well as the degree of their dominance appears to be specific characteristics of the site, rather than the period of protection.

Basal area

There is a perceptible increase in the basal area per hectare with increasing years of protection. Thus, it is observed that, on an average, the basal area has progressively increased from 6.55 m^2/ha in unprotected forest areas to 21.84 m^2/ha in the case of forest areas having been protected for 10 years, indicating an increase of over 233% (Figure 3). A variation in this trend is attributable to severe land degradation, xerophytic forest vegetation, high human and livestock population, and high pressure on forests.

Shrub population

Carissa spinarum is the most abundantly occurring shrub in forest areas. *Lantana camara* has, however, infested many of the forest areas to varying degrees. Generally,



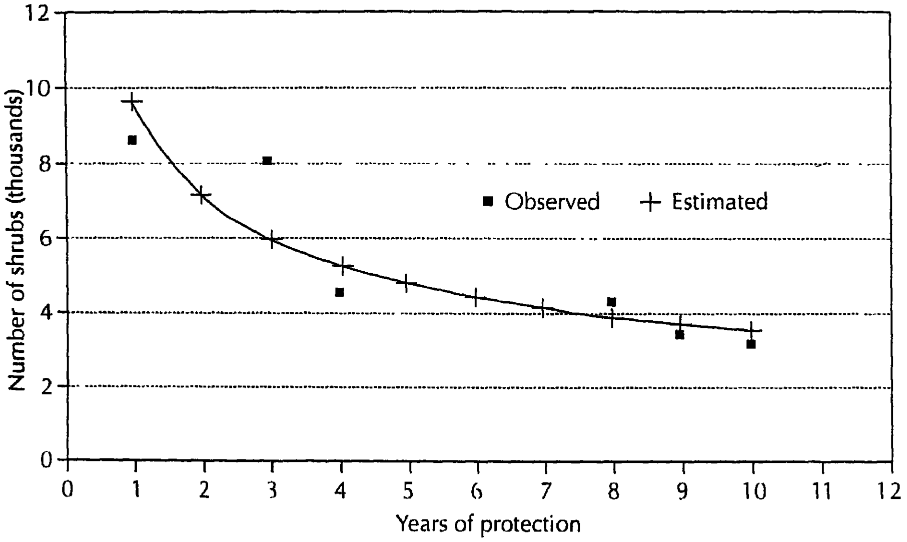
Note. $Y = e^{[0.4178 \ln(x) + 1.8482]}$; $R^2 = 0.83$

Figure 3. Basal area with years of protection

occurrence of trees and shrubs and their extent depend on site characteristics and plantations carried out in different areas. There is a marked decrease in the total number of shrubs as well as in the number of shrub species with increasing years of protection. It is seen that with certain variations, the number of shrubs/ha is maximum (13 885) in unprotected forest areas, whereas their number with 10 years of protection is minimum (3247); Paniwala (four years of protection) has 2860 shrubs/ha, which is due to a thick matting of *Spatholobus roxburghii* (climber) present in the area (Figure 4).

On an average, the number of shrubs/ha has progressively decreased from 12 553 (unprotected-control areas) to 3264 for areas protected over a 10-year period, indicating a total reduction of 74%. The number of shrubs/ha decreased by over one-third (35.4%) in areas with three years of protection and by around two-thirds (63.1% and 65.6%) with four and eight years of protection, the decrease between the two categories of protection not being very significant.

The decrease in shrub and regeneration count and the corresponding increase in basal area can be explained by the increase in tree coverage of the forests with increasing protection, thereby suppressing the growth of shrubs which are left behind in the competition for light and nutrients. Increasing competition as a result of continued protection is also reflected in the total number of shrub species in different forest areas. Species that are unable to compete in the process of forest succession are eliminated. This observation is substantiated by the fact that



Note. $Y = e^{[-0.4314\ln(x) + 9.1743]}$. $R^2 = 0.84$

Figure 4. Number of shrubs with years of protection

the average number of recorded species is approximately halved as the period of forest protection increases from 0–1 years to 9–10 years.

Tree regeneration

Most forest areas are deficient in natural regeneration of tree species through seed, primarily because of the absence of mother trees/trees of higher girths to produce adequate quantities of mature seeds. Thickets of such aggressive weeds/shrubs as *Lantana, Carissa,* and *Adhatoda,* and in some cases even *Nyctanthes* and *Dodonaea,* as also the pressure of livestock in some areas are responsible for the absence of natural regeneration through seed. Seedling natural regeneration of *Anogeissus latifolia* was, however, observed in certain areas; whereas regeneration of *Acacia catechu* is mainly through planting by the HFD.

Most of the natural regeneration of tree species is through coppice with a large number of coppice shoots arising out of the existing root-stock leftover as a result of excessive exploitation in the past, and adequate protection afforded in these areas, either through HRMS or because the site is not easily accessible.

Institutional impacts

The institutional impacts of the programme are evident in the context of the development of HRMSs as institutions for resource management and the institutionalization of JFM in the processes, procedures, and the working of the HFD.

HRMSs

The HRMSs have a plurality of roles and their functioning encompasses a political role and a stratification role. It has the responsibility to regulate use of, and access to, resources—specifically forest resources—through social practices and social norms. This has proved to be an important function in the context that in most of the villages the rights of people to forest produce is sanctioned as part of settlements over the years. Further, the resource-use has always been iniquitous, and has been defined largely by the economic stratification of village societies, with the rich always gaining a larger share of everything.

In the context of HRMS, the institution and its success can be defined in terms of the individual members, their characteristics and roles, and the viability of the institution itself in regulating behaviour, financial viability, resource sustainability, political existence, etc. All the HRMSs, which are part of the project, have undergone a sea change in their structure, functions, composition, etc., from when the programme was initiated. The degraded forest lands and loss-making processes employed for the management of forest resources are all things of the past for these areas. Regeneration of forests owing to protection by the villagers has improved the resource status tremendously. Systems for management of forest resources have been developed by all HRMSs to maximize benefits for the HRMS and its members. These and other issues that have rendered these HRMSs as viable institutions have been detailed, and the factors that could influence the sustainability of these institutions have also been dealt with in some detail.

Representation

A majority of HRMSs have attempted to attract and retain membership of all households across the village. This membership includes women as equal and independent partners, men and women from traditionally weaker sections, and families with women as heads of households. Thus, HRMSs have been able to create a stake for all individuals in forest protection and management. Greater interest generated in the functioning of the HRMS has, in turn, led to the need for approvals from the General Body (GB) for all major events and decisions. The rising need for clarity and accountability of all systems related to monetary transactions, decision making, and management options is seen to guide the functioning of the HRMS, reflecting control of members on its functioning.

There is greater representation in the Management Committee (MC) of the different sections of society, with women now having one-third membership of the MC (previously it was mandatory to have at least two women on the MC) and a conscious and proportionate representation from the weaker sections. Further, the role and functions of the MC have also come in for revision, wherein except for routine functioning, all major decisions require the approval of the GB. While the GB reserves the right to remove the MC or the office-bearers from their posts for non-performance, or any kind of discrepancies, the outgoing office-bearers are expected to provide an updated income and expenditure statement, and explain all transactions.

Most societies have developed their own norms for regulating forest use and producing harvest. Rules have also been developed by them for stopping outsiders from illicitly felling wood or harvesting grasses. Provisions for taking care of the resource needs of secondary users have been developed, and some of this is also taken care of by the rules proposed by the government. A reflection of the effectiveness of these rules and norms is evidenced in the vast decrease in cases relating to fires, thefts, illicit fellings, etc. The sense of ownership of the institution and the forests among the members in the societies, old and new, is a reflection of the enormous strides made towards the institutionalization of the JFM process in the Haryana HRMSs.

Institutional strengthening

At the society level, there are issues of financial viability, sustainability of the HRMS itself, the sustainability of the resource base, etc. A significant contribution is currently being made by the Tata Energy Research Institute (TERI) for institutional strengthening, and by the HFD and TERI for providing technical and managerial inputs, respectively. Many of the older societies are now capable of interacting with different agencies, including the HFD, and are able to access their requirements. They have a functioning system of rules and norms, and have the capability to handle all situations, including conflicts. This is a major outcome of the innumerable training programmes that have been organized for different sections of society including women, GB, MC members, office-bearers, etc. The newer societies could take a little longer to become self-reliant; the target for achieving this has been set before the proposed withdrawal date of TERI. It would still be important to identify and link HRMSs with local sources of professional expertise.

The concept of the federation proposed by the HRMSs is an important one precisely to take care of each other's requirements. The older HRMSs would be in a position to guide the younger ones towards sustainability. As far as the finances of the HRMSs are concerned, there are funds available with them which are essentially derived from the profits they have been making from management of *bhabbar* grass, and fodder grass; dam water for irrigation and pisciculture; membership fees; fines collected; etc. With the hope that the HRMSs would continue to avail the lease of the forest areas from HFD, their financial viability is assured. An improvement in the marketing of non-timer forest products (NTFPs), notably the *bhabbar* grass and bamboo baskets, could improve the income levels tremendously.

The HRMSs need to continue and facilitate the development of strong linkages with other similar institutions like the *Panchayats*, various resource MCs created by different development agencies, the different departments and extension wings of the government agencies to name a few.

HFD

The institutionalization process of the JFMP across the rank and file of the HFD continues and probably will be an on-going process. It is crucial for JFM, because the definition of roles of individuals in the institutional setting of the HFD has greater significance than individuals acting out parts on a rather limited time-frame. While it is accepted and proved that a high degree of motivation among the field staff of the FD could result in more effective protection and management of degraded forests by communities, efforts at building this enthusiasm is vigorously being pursued. This is largely being done through training, and the inclusion of JFM as a module in the departmental training of the forest guards in the HFD has proved very useful. However, it has been realized that awareness is the key to the effectiveness of the FD officials in furthering JFM.

Joint Management Unit

A Joint Management Unit (JMU) was established by the HFD in Morni-Pinjore and Yamunanagar forest divisions to:

- implement and coordinate the programme;
- assist in the identification of community management groups;
- design procedures for management group formation;
- facilitate the development of better working relationships between the HFD and the forest communities for setting up of HRMS with clearly-defined rights and responsibilities regarding sustainable management of forest areas; and
- organize training programmes for HFD staff, forest communities, and HRMS office-bearers to sensitize, motivate, and orient these target groups to JFM as community organizing procedures. This institution of JMU has played a very significant role in the successful implementation of the programme by facilitating the development of better working relationship between the HFD and the forest communities and has brought these two closer.

Working groups

The working groups established at the state, division, and range levels have proved to be an important platform for bridging the gap between the grassroots and the policy-/decision-making bodies. They have (as discussed earlier) been able to reflect the problems and prospects at the HRMSs in the higher levels of the HFD functioning in order to effect changes in management, policies, etc. to find solutions to problems.

Forest Guard: the vital link

The Forest Guard, typically, is the *ex-officio* member of the HRMS. In this capacity, he is expected to resolve disputes that may arise over the use of forest resources, clarify rules and by-laws of the HRMS, and offer technical advice on issues ranging from the maintenance of water-harvesting dams to the choice of tree species for plantation work. The Forest Guard, thus, provides a crucial link between the HRMS and the HFD. However, with watch and ward activities and raising plantations on government lands continuing to engage the attention of these and other lower level staff, JFM is seen as an increase in the workload without a proportional increase in remuneration or time allotment. This issue has been discussed at different fora and a solution is being sought.

Policy and rules

The legal framework for the JFMP in the state was provided by the enabling policy issued by the Government of Haryana on 13 June 1991. The policy was adopted following a detailed and intensive interaction and dialogues with the main actors, the village communities, and the field functionaries of the HFD. This led to the definition of the roles and responsibilities of the HFD and the village societies regarding protection, management, harvest, and benefit-sharing of the forest produce.

The JFM rules are in their final shape and have been presented to the Government of Haryana for approval. The availability of bamboos, fodder grass, and irrigation water at concessional rates, and access to fuelwood have improved the socio-economic status of the village communities dependent on the forests for livelihood and supplemental income. These issues are discussed in detail below.

Socio-economic impact

People's involvement in the protection, management, and sustainable development of forests in the Haryana Shivaliks has led to the socio-economic upliftment of the local communities, along with the ecological development of the area, and a range of institutional and legal changes as discussed earlier on. The four incentives offered under the JFMP, namely, irrigation water from water-harvesting structures, *bhabbar*, fodder grass leases, and bamboo permits at concessional rates, have greatly helped in the economic betterment of the local communities, and in galvanizing the people into collective action for protection and management of the adjoining forests.

JFMP in Haryana has several distinctive features. Over the years, the village community forest management societies have developed as a community institution at the grass-roots level, assuming a definite and purposeful role with clearly-defined rights and responsibilities. The Working Groups at the state, division, and the range levels provide a wider forum for framing policy and rules, resolving conflicts, and taking decisions related to the protection, development, and management of forests. The programme's strong training component has helped in bringing about attitudinal changes in the various target groups, and in developing mutual trust and appreciation of problems and limitations.

The socio-economic changes brought about by these four incentive mechanisms in the village communities having HRMS, and the institution-building process, have helped in the distribution of benefits equitably among all sections of village society.

Water-harvesting dams

As many as 122 water-harvesting structures have been constructed in the programme area as of 1996/97. While most have provided irrigation water to the villages and have formed an important incentive for society formation, a few are undergoing repair. Studies have shown that benefits from irrigation to the villagers are very high, and before the construction of these dams, agriculture was entirely rainfed. The other two sources of irrigation in the region are private tubewells and the permanent irrigation channels (*kuhls*) built by the *Panchayats*. These channels are fed by seasonal springs and, hence, are not very reliable.

Though some of the dams are not operational because of a sandy bed causing lot of seepage, there has been an indirect benefit in the form of a rise in the water table.

The production of wheat, the staple *rabi* crop, has increased manifold in response to irrigational input. Earlier, the average yield was nine quintals per hectare (3.6 quintals/acre), owing to deficient soil moisture, and scanty and uncertain rains. The present scenario of yields of major crops of select villages is presented in Table 4. Villagers now sell their produce, though on a small scale, in contrast to the earlier situation when cereals and pulses had to be purchased. Increased agricultural residues and growing berseem, which can be harvested till mid-April, have eased the problem of fodder shortage. Earlier, the *Gujjars* used to migrate with their cattle to cooler parts of Punjab, Himachal Pradesh, and Uttar Pradesh for almost eight months a year; this has now been reduced to about four months.

Apart from increased productivity, people now have to pay less for water (Rs 4/hour in Harijan Nada, Rs 10/hour in Lohgarh, Salehpur, Uttamwala instead of Rs 20–25 which they were paying earlier for the use of private tubewells). In Paniwala, extreme shortage of water has led the villagers to use water from one of the dams for domestic purposes. These water-harvesting dams have also contributed to the incomes of HRMS through pisciculture. The dam at Gobindpur has been leased to a private contractor for five years for the purpose at an annual rent of Rs 1000.

Similar initiatives to lease out dam reservoirs have been carried out in other HRMS villages like Masoompur and Dhamala. In the case of Masoompur, the HRMS had leased out the dam reservoir to a fish contractor for Rs 1000 for five years from 1990. In the case of Dhamala, the HRMS leased out the dam reservoir for Rs 1950 from April 1992 to March 1993. The village pond has also been leased out for Rs 800 for the same period. A cost-benefit analysis undertaken for pisciculture in JFMP areas indicates that such ventures are profitable right from the first year and become more lucrative in later years. Profits increased from approximately Rs 10 000 in the first year, when the initiative was undertaken, to Rs 45 000 by the fifth year.

Although availability of water for irrigation from these water-harvesting structures has helped the local communities in their economic upliftment, maintenance of these structures is one of the major problems. Firstly, the costs involved

Table 4. Present crop yields (quintals/ha)

Village	Wheat	Maize	Rice
Lohgarh	45	55	20
Harijan-Nada	35	45	18
Govindpur	50	50	20
Paniwala	38	45	13
Salehpur	45	55	20

Note. Figures are approximate and represent averages.

in the repairs of these structures are often beyond the capacity of the respective HRMS. Secondly, technically sound advice on repairs and maintenance is often lacking. Lastly, the communities view repairs and maintenance as the responsibility of the HFD.

The infrastructural and maintenance problems are, most often, of the following types.

- High rates of siltation due to weak geology and sparse vegetation cover leading to reduction in water storage capacity and clogging of inlet tanks. At present, the average siltation in dams is around 3 m.
- Improper selection of sites and/or poor design and construction. Spillways are the most common casualty.
- Lack of pipelines for water distribution since the HFD has not provided uniform infrastructure to all the villages. Adequate pipelines are provided for only 20% dams. The rest have either inadequate length of pipeline provided or none at all. In Darpur and Mandpa, water is distributed through open channels leading to a lot of wastage. In Uttamwala, people have raised Rs 250/ha (Rs 100/acre) from each member, and purchased and laid down their own pipelines.

Uneven terrain is yet another difficulty in optimal utilization of water from the dams. In Darpur, only the FD nursery, at the base of the dam, and another 3–4 ha of land are irrigated. The villagers have not been able to use the water for irrigation. Scattered and disjointed land-holdings with respect to the location of the dam also add to the unequal distribution of water. Gobindpur and Salehpur HRMSs have solved this problem by scheduling the water supply: each piece of land gets a fixed amount of initial irrigation before the second cycle begins. If the distribution starts from proximal during first cycle, it starts from the distal in the next cycle.

The major institutional problem faced in the case of this incentive is the collection of water charges and other dues. All HRMSs face this problem. Rs 30 000 (for the last three years) is yet to be collected by the Gobindpur–Mandpa HRMS. The situation is compounded by the fact that proper and regular records are not maintained in most of the villages. Many of these problems have been overcome following the large-scale repair work taken up by the HRMSs and the HFD. The villagers have made remarkable contribution towards this as discussed earlier, which only reflects the importance of the incentive.

Bhabbar *grass*

Bhabbar grass that grows in this region, though commercially valuable (it is an excellent raw material for paper pulp), is used in rope-making by the local village communities. The *Banjara* community is dependent on rope (*baan*) making for its livelihood.

Traditionally, *bhabbar* from these forest areas was leased to various paper mills located in Ambala and Yamunanagar districts. Villagers were allowed to cut a headload each for their domestic consumption. After the launching of JFMP, *bhabbar* leases were allotted to HRMS in some forest areas. While some HRMSs obtain *bhabbar* leases from the HFD and sell them in open auctions, some HRMSs sell the *bhabbar* to individual members of the society. Different systems under which these leases are managed have been discussed earlier.

Economic benefits to villagers from *bhabbar* are generally quite high, e.g., the HRMSs of Lohgarh and Raina have earned a profit of approximately Rs 100 000 in the past three years, which has been used in building up community infrastructure, like a *dharamshala* (guest house) and *kuhls*. In the case of most HRMSs which sub-let the lease to private contractors lease money is generally paid by the contractors to the HFD on behalf of HRMSs, resulting in very low profits to the societies. Pooling of money by only three-to-four members of the society for taking up *bhabbar* lease on behalf of the HRMS is also a common practice. Thus the principle of equity is frequently overlooked.

Where rope-making is concerned, a study analysed the benefits to *Banjaras* in Prempura village. Profits to the *Banjaras* were higher when the *bhabbar* grass was leased to the community than when it was leased to a contractor. The internal rate of return (IRR) worked out to approximately 80% when *bhabbar* grass was leased out to the community. When the *bhabbar* grass was sold to the contractor the IRR worked out to as low as 17% (Table 5).

Further, the study indicated that up to 12 days of employment was generated when *bhabbar* leased to the community was used in rope-making. However, with the use of machines the *bhabbar* lasted for fewer days.

Fodder grass

The Shivalik hills of Haryana are mostly inhabited by pastoral communities and the livestock population is high. With high livestock populations, fodder grass is obtained from the forests where extraction is regulated through *dati* system and is restricted to the period October to March.

As in the case of *bhabbar*, with fodder grass also, an individual from the village deposits the lease money on behalf of the society, and protects the forest during monsoons, after which he allows each member to go to the forest daily for procuring fodder grass. For this, fee (*dati*) is charged which ranges between Rs 50

Table 5. IRR to *Banjaras* from rope-making

Lessee	Rope made by	Total cost (Rs)	Sale price (Rs)	Profit (Rs)	IRR (%)
HRMS	Hand	490	700	210	42.8
HRMS	Machine	246	450	204	82.9
Contractor	Hand	645	700	55	8.5
Contractor	Machine	384	450	66	17.1

Source. TERI (1993).

and Rs 350/member/season. On the other hand, the HRMS in Raipur Rani Range pays Rs 90 as royalty to the HFD, after which the grass lease is sold in an open auction by the HRMS. Thus, in this case, the society stands to profit more than in the former. But even in the former case, all villagers get the benefit. The number of members who do not own any animals is negligible, and in such cases, they sell their share of the fodder, thus getting indirect benefits. The practice has encouraged stall-feeding and put an end to open grazing, resulting in increased productivity of grasses and protection of tree species, eventually leading to environmental security. Stall-feeding has also changed the livestock-mix in favour of buffaloes.

A comparative study conducted by TERI on the economics of buffalo and goat rearing found that buffalo rearing is economically feasible under stall-fed conditions even when the entire feed has to be purchased. In comparison, however, goat rearing is not economically feasible except when goats are left to graze in the forests. But open-grazing of goats in the forests has adverse environmental impacts. The increased productivity of grasses due to protection have reduced the distance and the time required to fetch grasses and firewood from forests.

Bamboo permits

The *Bhanjdas* of Bargodam, Kalka, and Bowana depend on bamboos from the surrounding forest areas for sustenance. The traditional procurement was regularized under JFMP. At present, each household is given a permit of 100 bamboos per month (from 15 September to 15 June) at a concessional royalty of Rs 7 for 100 bamboos.

The *Bhanjdas* have benefited tremendously from JFMP since their monthly quota of bamboos has more than doubled, even as royalty has been reduced to less than one-fourth. This has enhanced their incomes and consequently their living standards. Members claim that the ecology of surrounding forests will improve owing to the care taken by them while extracting bamboos (they cut only three-year old bamboos and decongest the congested clumps). Their earnings could be enhanced further if they market the produce themselves instead of entrusting the job to money lenders, who charge exorbitant commissions.

A TERI case study on the issue of bamboo basket-making found that monthly earnings from making baskets of different sizes ranged between Rs 396 from baskets of the largest size to Rs 425 for baskets of the smallest size. Further, 15 days of employment was created every month from basket-making. The study also indicated that direct selling of baskets by villagers could increase the monthly earnings of the community by 99%–140% (Table 6).

The state of Haryana has experimented with the JFM programme only in the Shivaliks on forest lands. The extension of this programme to plantations on common and other revenue lands requires a fair deal of flexibility to be built into it. Even in the Shivalik region, the great deal of flexibility and autonomy available to the HRMSs has contributed a great deal to their emerging as strong institutions.

Table 6. Monthly earnings from making baskets of different sizes

Size	Bamboo requirement per day (number)	Number of baskets made per day	Market price (Rs)	Employment period (days)	Monthly earnings (Rs)
Largest	5.0	5	8	20.0	396.50
Large	5.3	8	6	19.0	452.50
Medium	7.0	14	4	15.0	416.50
Small	6.6	20	3	14.3	425.50

Source. TERI (1992)

A very important institutional implication for the HFD in the context of JFM is the change required in style of functioning, structure, and culture of the FD.

It is in the cooperative relationship between the state and the local people that the future direction of forest administration lies. It is the only feasible option for meeting the twin objective of ecological security and livelihood security. It would also reduce (and in the long run eliminate) wasteful conflicts between the villagers and the FD. A participatory approach to forest management would also be in keeping with the worldwide trends in development thinking.

Implications for the HFD

As experience in the Haryana JFM has revealed, the important principles from which the HRMSs derive their strength are:

- benefits from increased productivity of natural resources that are protected by the people accrue to each member of the forest protection society;
- members have the authority to regulate behaviour of the resource users and can impose penalties on resource abusers;
- resource misuse by non-members is regulated and provisions have been made for these non-members also to derive benefits from forests, but through a laid down procedure; and
- general safeguards for preventing concentration of power in select few by making membership to the MC broad-based and representative across all sections of village society.

Forest productivity

As a result of the introduction of protection through JFMP in these areas, the yield of *bhabbar* increased to 233.3% and 257.6% in the third and sixth years of protection, respectively, as compared to the no-protection areas. However, thereafter, continued protection did not improve the yield of *bhabbar*; rather there was a significant decrease in the production of *bhabbar* in the tenth year of protection.

In the case of other fodder grasses also, the trend of yield was somewhat similar except that the increase was more pronounced in the first three years and depression in yield started soon thereafter.

The drop in yield in the later years of protection is probably due to increase in the overhead shade cast by the developing tree cover. If the interest and enthusiasm of the local communities for protection of the forest areas through participatory management is to be sustained, the yield of grasses will have to be maintained at around the six-year protection levels. This would be possible by adopting wider spacing for tree species. A management strategy for these forests should, therefore, be worked out based on some of the following considerations.

- Adoption of wider spacing for planting of tree species, e.g., 8 to 10 m instead of 3 × 3 m, or 4 × 2 m, etc.
- Use of light crowned tree species for afforestation such as *Acacia* species, *amla*, *semal*, etc.
- Land-use classification aiming at identification of areas suitable for intensive tree cultivation and for grassland development, separately. The planting of tree species may be encouraged on patches of good soil with favourable moisture regime (e.g., shaded gentler slopes and gully beds), whereas, the steeper areas with eroding shallow soils may be earmarked for grassland development.

Positive correlation has been found between the period of effective protection and various parameters such as tree population/ha and basal area. At the same time, it should be mentioned that 10 years is a relatively short period to reflect any effective change in the forests. Continued protection over a longer timeframe, universal adoption of stall-feeding, and judicious silvicultural treatments are necessary for long-term sustainability of the JFMP. The increase in tree population and basal area, and the decrease in the occurrence of shrubs with increasing years of protection, reinforces the fact that tree canopy cover has been gradually improving over the years. Per capita availability of resources is another important factor which influences the health of forests considerably. The forests of Baghpat and Darpur are comparatively much larger and, therefore, result in increased per capita availability of forest land for the villagers.

In Ambala Division, protection of forests appears to have been due to their inaccessibility, in addition to the collective protection afforded by villagers in response to the incentive mechanisms provided to them. Here again, in spite of a better hydrological regime, as compared to Morni-Pinjore Forest Division, water is the major felt need of the people and, therefore, the primary motivating incentive.

Thus protection, whether through a conscious effort of resource-users or because of such factors as inaccessibility, is the key to conservation. Hence, forest conservation programmes have little chance of success without the willing support and cooperation of the people, who have to be sensitized and motivated towards this goal. The present study establishes that (1) people will act collectively to protect their surrounding vegetation if adequate motivation is generated through meeting their short-term economic interests, and (2) protection of forests *per se* is one of the most important factors for regenerating and developing degraded forests and for the sustainable management of existing forests.

Financial aspects

The Haryana JFMP has not been a loss-making proposition as highlighted in draft rules put up to the government for approval. Also, the effort has not required any extra financial support from the HFD owing to the fact that the territorial wing of the HFD has also taken up the JFMP for implementation. Further, the willingness expressed by the HFD to share its authority, control, and economic benefits of the forests with the local people has created a conducive atmosphere for the partnership.

HFD restructuring

An important link between the HFD and the village communities are the forest guards. Their involvement in the functioning of HRMSs is very crucial. Typically, a guard's work in the JFM would involve initiating the process, establishing HRMS, convening meetings of the village, inspecting accounts, and organizing annual MC elections, etc. Apart from this, political pressures in the form of threats of transfer and suspension, loom large over the field staff of the HFD. Frequent transfers, referred to earlier, and minimal support from senior officials have been cited as major reasons for the low level of motivation in forest guards. Attempts are on to change a lot of this through trainings, discussions, and workshops, being held for FD officials across the ranks.

Thus, while a great deal of change in the basic attitude of the HFD staff has been achieved, these institutional reforms assume greater importance in the withdrawal phase of TERI's functioning in the area. Improved communication, greater empathy of the higher officials with the field staff, further strengthening of the range-, division-, and state-level working groups would be crucial. The training of the HFD staff at the field-staff level (including the forest guards, foresters, and range officers) and the higher levels has been going on for long. Training has become part of the departmental programmes, and a reflection of this is the one-week JFM course for forest guards as part of the departmental training.

The decrease in offences in the context of illicit felling, grazing, lower incidents of fire, and fewer episodes of conflicts are all indicative of the improving relationship between the forests, the people, and the department. The many platforms that have emerged to forge greater interaction, the increased accessibility of the HFD to the people and *vice-versa*, all point to a strong partnership.

Another very important issue is the induction of more women staff into the HFD. While this increase at the higher levels is desirable, it is crucial at the field functionary level. Especially where JFM has its foundations in the principles of equal representation for women and benefits to them, it is very important that the HFD has women staff to reach out to the already discriminated village women. They would be essential to provide these village women a voice in the process. A large portion of this has been taken care of by the support team. However, the need for doing something urgently at the HFD level cannot be over-emphasized. With limited opportunities available to women in Haryana for educational and professional pursuits, it would be important for the HFD to accommodate these limitations, and provide space for women to enter the HFD. Women could then contribute in a significant fashion for their greater acceptability and participation in JFM, and in similar programmes that have a major role for people, especially women.

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Future Initiatives

Introduction

The Joint Forest Management Programme (JFMP) in Haryana aims to develop, promote, and implement, sustainable participatory forest management systems with joint involvement of the Haryana Forest Department (HFD) and local communities. The fundamental objective of the programme is the systematic integration of the JFMP within the policies, programmes, procedures, and operations of the HFD along with the involvement of communities in conservation, regeneration, and sustainable management of forest resources. The Joint Forest Management (JFM) Policy of the Government of Haryana aims at tying the economic interests of villagers, living within or adjacent to forest areas, with sustainable management of those areas. This is to be achieved by motivating the villagers to organize themselves into registered societies for improving the productivity of forest area by giving them a major share of the increased production. This is achieved resulting from their participation. Besides improving the economic status of villagers, the joint management approach aims to improve the environment of forest areas of the state. At the same time, JFM is to be integrated into the working of the HFD, such that this programme gets institutionalized, and is eventually adopted. The rules for the programme, currently awaiting sanction from the government, would boost and expedite this process further.

For the villagers to sustainably manage and develop resources, self-sufficient institutions in the form of the Hill Resource Management Society (HRMS) have been created. These HRMSs have shown distinct progress towards self-reliance, as more and more societies enforce self-imposed discipline for protection and management of forest areas, exhibit greater transparency and accountability in their functioning and daily operations, and undertake active voluntary participation in plantations, maintenance of dams, grass lease, etc. The trend of the HRMSs' commitments in terms of time, efforts, and money in various activities is a significant development towards active community involvement in resource management.

That JFMP is a slow and long-drawn process is a well-known and widely accepted fact. Attitudinal changes in the staff of the Forest Department (FD), policy-makers as well as village communities, to orient them to this new approach to forest management, while being difficult to achieve, is crucial to the sustainability of the programme. The programme has faced a whole range of constraints during the implementation process but many of these have been overcome, as detailed in this chapter.

Constraints

The concept of the JFM operates on the basis of linking some of the direct economic interests of local communities with the protection, regeneration, and sustainable utilization of adjoining forests. This has not only resulted in an all-round economic upliftment of the local user groups, but has also had a positive impact on the forest cover of the tract, increasing yield of non-wood forest produce, reducing run-off and recouping biodiversity. As with all programmes with a social component, the JFM approach has been more successful at some places as compared to others. The reasons for better success could be attributed to the facilitating factors of dynamic policies, amicable attitudes, simplified procedures, quick perceptible gains, motivated village groups, and progressive development of mutual confidence and trust between the forest communities and the functionaries of the FD.

However, for steering of this programme on a sustainable and successful track in the future, it would be crucial to pinpoint reasons for the failures of the approach at places, where it has not been able to produce the desired results. This self-evaluation process ensures that important lessons are learnt for corrective measures that may be called for. Such matters concern a range of legal, administrative, social, institutional, technical, ecological, and economic issues, and it would be only wise to analyse their implications for the future development of the JFMP. Some of the impediments and constraints coming in the way of smooth implementation and development of the JFMP are discussed here.

Lack of legal support

India's main legislations pertaining to the management of forests, the Indian Forest Act, 1927, and the Forest Conservation Act, 1980, are primarily concerned with protecting the forest resources against encroachments and likely damages, offences, and thefts. There is no clear-cut provision in any section of these Acts for participatory management and sharing of produce and benefits from the forests with the local communities. The new Forest Policy of 1988 recognizes and advocates the need to associate the people closely with the protection, regeneration, and development of forests; and that the revenue generated through such (participatory) programmes should be shared with the local communities in order to provide an incentive to them (for the JFM). But these policy directives have not yet been given the requisite statute base through appropriate legislation or amendments in the existing Forest Acts. This anomaly between the Forest Policy directives and the provisions of the Forest Acts is hindering the adoption, formalization, and integration of the JFM into the normal operations and working procedures of the FD.

Adoption of JFM rules

The JFM Policy was adopted by the Government of Haryana vide their notification of 16 June 1990. To give a practical shape to this policy, a set of JFM rules were drafted after a series of consultations and deliberations between the functionaries of the FD, representatives of the forest communities (HRMSs), resource persons of TERI, and some other organizations. Apart from covering various aspects of the JFMP, these rules specify the exact mechanism for benefit-sharing between the FD and the user communities. The PCCF had recommended and forwarded these draft rules to the Government of Haryana in 1992 for their approval. The approval of these rules is, however, still pending with the government, and, as a result, the village communities are getting disenchanted, and have started doubting the intentions of the government. Moreover, the FD is finding it difficult to fulfil its promises and commitments made to the people while initiating JFMP in the area. To generate and sustain people's interest and faith in JFMP, it is highly desirable that these rules are approved at the earliest.

Inconsistent executive provisions and procedures

Under the JFM Policy of Haryana, the HRMSs have continuously been protecting their forests for a number of years, and *in lieu* thereof, have been getting lease of *bhabbar* and fodder grasses from the FD on a predetermined price every year. There have been instances where the HFD decided to reverse this and auction the grasses to private contractors, under certain assumptions. While such orders could lead to the erosion of trust between the communities and the HFD, often, any misgivings have been arrested following the repealing of these orders with new facts coming to light well before any damage has been done. However, the need for a steady commitment to the JFM Policy both in letter and spirit, and its assured, uninterrupted application by the FD and the HRMSs, cannot be over-emphasized.

Frequent transfers of forestry staff

JFM is a partnership between the FD and the forest communities, and is based on mutual trust and confidence. It requires constant dialogue, close contact, mutual understanding, and conducive rapport between the forestry staff and the village community. Also, both the field functionary and the villagers invest a great deal of time in building a rapport and a working relationship with each other. The frequent transfers of FD staff from non-programme areas to programme areas, creates the need for re-orientation of the newly posted staff to the JFMP. All this undergoes an upheaval with each transfer, and the time lag has the potential to retard the progress of the programme. If and when any of the staff is transferred, the new incumbent has to devote a lot of time, and energy to re-establish the required level of rapport with the local villagers. Such a time lag disrupts normal vibrant functioning of the JFM. When the transfers are frequent, its impact is disastrous for the JFMP. It has been seen that not only the field staff are transferred quite frequently, but even the executive officers (like range officers, divisional forest officers, and conservations of forests) are usually transferred once to thrice in a year. For the success of the JFMP, it is imperative that a staff or an officer should be allowed to function in a given posting for its full tenure of at least five years.

Top-down system of working and centralization of power

The organizational set-up of the government departments functions by flow of orders, directives, commands, and decisions from the top to the bottom. The planning and decision-making processes are more or less centralized at the top, and there is very little flow of ideas, perceptions, information, suggestions, views, and need-based demands from the bottom (comprising the people, field staff, and executives) to the top (administrators, planners, decision makers). The JFM philosophy entails working with the people, for the people, and by the people. This requires participatory discussion, planning, and decision-making at the community level, as well as adequate devolution of powers and authority not only to the field staff of FD but also to the village institutions (HRMSs). There is, thus, a need for a restructuring of the organizational functioning to create a conducive environment for the JFM. The HRMSs should be empowered to deal with forest offences at the village level itself.

Synchronization of working plans and microplans

Working plans of 10-year duration are prepared by the FD for the management of forests falling under a forest division or district. A working plan contains a broad set of prescriptions for the treatment and management of different forest types occurring in the entire division. However, in the case of a forest community or HRMS, a microplan has to be prepared for joint management of the forest resources of the village(s). A microplan is more site-specific; caters to the needs and problems of the HRMS concerned; and is conceived, prepared, and implemented by the villagers themselves through the participatory processes involving the community and the forestry personnel. Many local features and aspirations of the people for development or management may not be addressed by a working plan, but a microplan lays emphasis on local problems and their solutions as perceived and agreed to by the people. There is, thus, a dire need to synchronize the preparation and implementation of the working plan of a division with the microplans of different HRMSs falling under that forest division, so that the two documents (working plan and microplan) do not work at cross purposes.

Management and allocation of funds

The HRMSs are generating their own funds through the sale of dam water, *dati* charges for fodder grass, fish culture in water-harvesting dams, and disposal of surplus *bhabbar* grass in the open market. Many a time, conflicts have cropped up in certain HRMSs on account of doubts raised by the members regarding misuse of funds by their managing committee (MC). This problem, generally, arises when an MC decides to utilize the funds on various activities in a village without taking formal concurrence of the general body of the HRMS, or if various records (like membership register, dam water register, *dati* register, cash book, bank account, and receipt books) are not maintained properly, various dues or charges are not recovered in time, or minutes of the meetings are not duly recorded, accounts are not audited, and there is lack of transparency in the management of funds.

It has generally been seen that the president or the secretary of an MC may resort to adhochism and populist measures in the management and use of the HRMS funds, without seeking concurrence of the general members of the HRMS. There is a need to lay some guidelines for suitable apportioning of the HRMS funds for use on some broader activities like improvement of the forest, maintenance of dams, infrastructural development, and social activities in the village. At least about 25% of the Society savings should be ploughed back for regeneration and development of forest resources, and another 20% to 30% should go to the reserve fund of the Society in their bank account. Forestry field staff should be duty bound to assist the HRMSs in maintaining records and auditing accounts.

A suitable mechanism needs to be worked out for the reallocation of certain divisional budgetary funds directly to the HRMSs falling in the Forest Division/ Range, so that people may be able to implement their microplans effectively under the technical guidance and supervision of the forestry staff. Unless supplementary funds are made available to HRMSs, the concept of microplanning for the JFM will not be able to produce the desired results.

Repair and maintenance of water-harvesting dams

Providing irrigation water through construction of water-harvesting dams is one of the key incentives for involvement of people in JFMP. Most of the forest communities in the Shivaliks of Haryana organized themselves into HRMSs mainly at the prospect of assured irrigation water from the newly constructed water-harvesting dams in the forest catchments. Some of the newly constructed dams, however, got breached and became non-functional during the first two to three years of their construction. Spillways of most of the dams have been getting damaged in spite of repeated repairs carried out by the FD from time to time. Seepage losses in some of the dams were so high that they could not store any water in their reservoirs, whereas some other dams got silted up in the first few years of their construction. No planned treatment of the dam catchments for soil conservation was carried out in any area. In a number of places, the dams were constructed, but no pipeline was provided for the distribution of water to the fields. Generally, the people were not consulted for the selection of dam sites, nor was their participation sought during the construction phase for the management of the dam, and the process of the HRMS formation came much later. Whatever may be the reasons for failure and widespread repeated damage or non-functioning of these dams, the net result is that the concerned village communities lost interest or incentive for participation in the JFMP. Some of the HRMSs have been spending large sums of their savings from sale of grass, etc. on repair and maintenance of the dams. However, wherever the damage is excessive or there is a failure of structural design, it is not financially feasible for the HRMSs to undertake the repair work on their own. A suitable mechanism, therefore, needs to be evolved to empower the people for the maintenance and management of the dams after initial care and maintenance by the FD for the first three years or so. Some criteria should be worked out to ensure credibility of the repair work, if and when undertaken, so that such repairs are not called for again and again.

Sharing of benefits

All user groups and the households in a village will evince interest in the JFMP only if they individually derive adequate benefits from the forest resources. Those sections of the community who are not dependent upon the forests or derive no benefit from the forests, will not be interested in their protection or development.

The benefit of irrigation water from water-harvesting dams is availed exclusively by the farming community only, and the landless people are generally denied the right to dam water in any form. Moreover, the farmers having land nearer the dam, sometimes draw more water for irrigation than the farmers whose fields are away from the dam or whose fields are at comparatively higher level and the dam water cannot reach there by gravity flow. Only recently, a beginning has been made in a few HRMSs to share the available water equally amongst all the households, and to allow the landless members to sell their share of water to those needing it. A similar arrangement is called for to share use of fodder grasses from the forest area.

Conflicts

The division of the forest area and resources between adjacent villages (HRMSs) at times poses a complex problem due to traditional usage of an area by more than one village, hilly and cut-up nature of terrain, limited accessibility through certain fixed obligatory routes or points, wide variation in forest cover, composition and its economic value per unit area, etc. As the people are becoming aware of the benefits of the JFM, area conflicts between neighbouring villages are getting more pronounced. Fixing of lease price of *bhabbar* and grasses for individual HRMSs in such a situation is a ticklish matter. There are many instances when a dam is situated in the forest of one HRMS, but its water is also used by people of an adjoining HRMS. Recovery of water dues and maintenance of the dam in such cases become a point of discord between neighbouring communities. When the JFMP was launched initially, only a few communities came forward to form

HRMSs. Due to the continued protection provided by those HRMSs, income from grass production from such areas has increased manifold. Now, the intervening villages (who did not opt for JFMP) are staking claims over the rehabilitated areas of neighbouring HRMSs even though they may continue to neglect their own forests. How can the communities which have originally protected those forests for a number of years be suddenly deprived of the benefits from them, at this late stage by transferring their area to a new HRMS?

Different social groups in a village have diverse levels of dependence upon forest resources. Landless people are dependent solely on the forest for their fodder needs for cattle and fuelwood, etc.; whereas the farmers are able to grow appreciable quantity of fodder and also some fuelwood on their farm land itself. The farmers and the rope makers would want the forest to be managed mainly for *bhabbar* production, whereas *Gujjars* are more interested in the production of fodder. *Gujjars* of Sukhomajri usually cut newly sprouting green *bhabbar* grass (*Mongri*) for fodder purposes during scarcity period of dry summer months, whereas *Jats* of the adjoining Dhamala village do not permit the cutting of green *bhabbar* grass. For the success of JFMP, such intra- and inter-HRMSs' conflicts should be resolved carefully and amicably.

Sustainability of production

The involvement of villagers in the protection of forests for JFM is tied to their interest in the production of benefits from the forest catchment, e.g., dam water for irrigation, fodder and *bhabbar* grass, and non-timber forest products (NTFPs). Protection of degraded forests against grazing, fires, felling, etc. results in the regeneration of vegetative cover and improvement of site conditions. It has been seen that with continued protection, the production of *bhabbar* grass more than doubles in the first three years, whereas production of fodder grasses may go up by five to six times the original. This increased production is more or less maintained at this level for the first five to seven years but starts declining thereafter, mainly due to the progressively increasing shade cast on the ground by the regenerating shrubs and tree species. The population of trees may increase four to five times with protection over a period of six to ten years. With this increase in stocking and canopy density of trees and shrubs, the growth of light-demanding grasses gets suppressed, resulting in decreased production of grasses. Simultaneously, the water yield (as run-off) from the catchment also decreases with steady increase of vegetative cover and the accompanying increase in consumptive use of water by vegetation.

The unprotected hilly watersheds usually release 60%–70% of the rain water as run-off. When such watersheds were protected for 25–30 years at the Soil Conservation Research Centre, Chandigarh, the run-off yield came down to about 10% (or even zero in some cases). People are immediately more interested in the yield of water and grasses than the growth of trees. Sustaining the production of these benefits at an enhanced optimum level is of prime concern if the interest and involvement of the people in JFM is to be maintained. This would require evolving suitable management practices and silvicultural systems for long-term application in JFM areas.

Lantana infestation and increase in wildlife

Lantana bushes have generally been growing as hedges on field boundaries. Now, this species is invading open spaces in wastelands and lower reaches of hill slopes, and is progressively becoming virulent over vast forest areas. Growth of useful grasses over many areas is now being replaced by thickets of *Lantana*, leading to a drastic reduction in the production of forage grasses and *bhabbar* from these areas. Moreover, consequent to the restoration of vegetative cover as a result of JFMP, many of the indigenous wild animals are coming back to these areas. So much so, that the population of wild boar and blue bull has increased substantially in some of the areas.

These animals come out of the forest cover during the night and cause extensive damage to the agricultural crops at the fringe of forests. There is a need for incorporating wildlife management as part of the JFMP. Suitable control or culling measures need to be introduced to restrict the population of wild animals within the carrying capacity of these forests, so that the losses to the local farmers are reduced.

Marketing of produce

Villagers sell their forest-based products like *bhabbar* rope, brooms, brushes, bamboo baskets, mats, and milk, individually in the local market or through some middlemen. Generally, the villagers take advance loans from middlemen and remain bound to sell their products through the middlemen only. Entangled in such a debt trap, they do not get real market value of their products, and are always exploited by these traders. There is, thus, a need to evolve and establish a joint marketing mechanism for the HRMSs, including arrangements to provide training to villagers to set up cottage industries for the manufacture of value-added products.

Organization of the FD

The FD has special wings for social forestry, wildlife management, watershed management, logging and marketing (Forest Corporation), planning and research, etc. Even though JFM is an important feature of the Forest Policy, it needs greater legislative support to get ingrained in the organizational set-up of the FD. There is, therefore, a need to create a special cell in the FD for directing, coordinating, and monitoring the JFMPs at the state and district levels.

Inadequate database

JFM policy and rules stipulate that increased production of *bhabbar*, over and above the initial baseline yield, resulting from voluntary protection provided by the community will be given to the HRMSs concerned at 25% of the mean lease price fixed by the FD. Similarly, the HRMSs will be given 25%–50% of the gross sale income received from sale of timber, etc. at final fellings in the forest, depending upon whether the initial stocking density of the forest at the time of the formation of the HRMS was above 0.4 or below 0.4, respectively.

It has been seen that in most of the cases, neither any initial baseline survey was carried out to assess the condition and production levels at the time of the formation of an HRMS, nor have any subsequent benchmark surveys been carried out by the FD to assess the change or extent of improvement in stocking and production of forest resources. This lack of essential data is bound to create problems for sharing of forest produce between the HRMSs and the FD. Since a majority of the HRMSs are only two- to three-years old, it will still be worthwhile to conduct the necessary assessment surveys and baseline studies for building the required database at the earliest.

Future plans of action

A careful perusal of the constraints present in the programme implementation process reveals that a majority of them could be tackled by a restructured or differently oriented HFD, a confederation of the HRMSs, and a further strengthening of the mutual trust and cooperation between the HFD and the HRMSs. These are reflections in light of the experience gained from institution-building, operation of the JFMP, interaction with local communities as well as the forestry staff and officials in Haryana and some other states. These actions require the involvement of the HFD and the HRMSs in different measures.

HFD initiatives

JFM rules

The JFM rules framed under the JFM Policy 1990 (Government of Haryana) are the fundamentals of faith for a stable partnership between the people and the FD. These draft rules have got bogged down at the government level due to the usual bureaucratic apathy for any revolutionary social change. Approval of these rules should be the top priority so that the rights and responsibilities or duties of the two partners of JFM are amply clear to all concerned, at the very outset.

Working systems integration and improvement

There is a need to reform and gear the working of FD for creating a conducive environment for JFM through integration and improvement of various operational components like administration, information, and monitoring systems.

The interventions in orienting and strengthening the administrative systems of the FD would involve working towards formalization of a Departmental Cell to coordinate and monitor the JFMP, laying down a charter of duties and responsibilities of the FD staff towards the HRMSs, realistic empowerment of the HRMSs through interactive procedures and allocation of funds by the FD for undertaking developmental work in the JFM forest areas, development of guidelines/framework for the utilization of the HRMS funds and savings, streamlining the procedure for leases for various NTFPs, and field demarcation of forest areas between the HRMSs. A special cell headed by a CCF should be created to plan, coordinate, and monitor the operations of the JFMP, and deal with related issues as they crop up.

New incentives and catalysts

Dam water, grasses, and bamboos are the three main incentives to the villagers, at present, for getting involved in the JFM. There is need to explore and develop some more attractive incentives for the forest communities so that the JFMP could also be extended to those areas where dam water and *bhabbar* grass or bamboo is not available. Perennial flow of water in forest streams, wherever available, can be tapped through *kuhls* or solar pumps for irrigation purposes. Fish culture can be taken up in village ponds (apart from the water-harvesting dams). *Diospyros melanoxylon* (or *Tendu* trees) and *Bauhinia* species (*Kachnar*) occur naturally in some forests (particularly in the Yamunanagar tract). Leaves of these species are useful for *bidi* making, and this resource can be managed for setting up a *bidi* industry.

Similarly, trees of *Butea monosperma* (*Dhak*) and *Boswellia serrata* (*Salai*) occurring in many of the Shivalik forests can be used for tapping their valuable gums. *Bauhinia vahlii* (*Maljhan*) occurs extensively in the Sal zone of the Shivalik hills, and leaves of this species are ideal for leaf plate making. *Morus alba* (mulberry) is indigenous to this area, and there is great scope for the development of sericulture industry if mulberry trees are grown on field bunds, stream banks, marginal lands, and low-lying areas in the forest. Bee-keeping for honey can be an attractive proposition in the vicinity of forest areas having flowering trees or bushes of species like *Karonda, Sisham, Kikar, Khair,* etc. Planting medicinal and fruit plants like *Amla, Harar, Baheda, Jamun, Khirni, Lahsuda,* etc., can yield high dividends from the Shivalik forests.

Microplanning

Operationalization of the JFMP by the FD through people's participation necessitates the formulation of microplans for each HRMS area. Implementation of such microplans will be carried out by the HRMS concerned, with technical and financial assistance from the FD, or other departmental agencies, programmes, etc.

Marketing support systems

Manufacture of value-added products as a forest-based local cottage industry will be encouraged, and suitable marketing mechanism or cooperatives will be established to generate avenues of gainful employment in the villages, based on sustainable management of forest resources. The HFD would explore linkages with other government departments to take this forward.

Initiatives by HRMSs

Confederation of HRMSs

A confederation of HRMSs needs to be constituted to serve as a common link or bridge between the HRMSs and the FD for sustaining the people's movement initiated through the JFMP. The confederation would represent and watch the common interests of the HRMSs in terms of institutional, administrative, and operational matters connected with the JFMP, and will assist the FD in the smooth functioning of the Programme. A suitable constitution, charter of activities, and by-laws of the proposed confederation would be drawn up after consultations and deliberations with the HRMSs, local non-governmental organizations (NGOs), and the FD.

Women's participation

Greater involvement of women in the JFMP through their participation in various JFM activities by way of active participation in the HRMS meetings, decision-making, and operational roles would be promoted, particularly in the preparation and execution of microplans. Workshops for women members will be organized to enhance their capabilities for increased participation.

Energy conservation

Fuelwood and cattle dung are the prevalent sources of energy in villages. There is a need to wean away the people from the use of these two valuable resources, by making alternative sources of energy available at reasonable rates. Efforts will be made to promote the use of energy conservation devices in the JFM areas, e.g., improved *chulhas*, biogas plants, *Lantana*-based gasifiers, and solar devices, etc.

Joint initiatives

Training for capacity building

Training workshops of field staff of the FD and village communities will be conducted jointly in the villages as a capacity-building measure, with emphasis on collaborative functioning and maintenance of essential records of the HRMSs. To introduce the concept of confederation and its working, study tours to other JFM areas where confederations exist, would be organized for members of the HRMSs and forestry officials. Training workshops-cum-camps would be organized for women to bring about greater involvement of this user group. Special training workshops will be conducted for joint working of the confederation and the FD. Capacity-building exercises will also cover training for participatory microplanning, baseline surveys, impact assessments, training of local resource persons, and training on technical matters such as establishment of nursery, planting techniques, maintenance of dams, checking of soil erosion, fish culture, and sericulture, etc.

Systems for communication, monitoring, and evaluation

An effective system for to-and-fro speedy communication and information dissemination between the people and the FD will have to be designed and put in place through consultation with the parties concerned. This will help in the speedy redressal of people's grievances and timely dealing with bottlenecks, conflicts and impediments, in the way of the JFMP.

Regular monitoring of the inputs, processes, and impacts of the programme is essential to gain insight into the usefulness or otherwise of various measures, and to take timely corrective steps, wherever needed, for steering the programme in a positive direction. A strong monitoring system will, therefore, have to be established and integrated into the administrative set-up of the FD. Independent bodies like NGOs may also be involved for impartial assessment of various aspects of the programme.

Conclusion

The Haryana JFMP has come a long way from the pilot scale operations of the pre-1990 phase. The transition from a policing approach to a participatory system of forest management has been achieved through institution development and capacity building, both in the HFD and the user community.

An analysis of the institution development shows a remarkable transition in the potential of village institutions, from creation and formalization to active participation in programme operations. In addition to the expansion of the programme in terms of the total number of village institutions, there has been an expansion in the membership of various HRMSs, coupled with enhanced participation in resource management. The changes are also visible in a qualitative improvement in societal functioning, in terms of record keeping, regularization and/or systematization of functioning, and increased sensitization towards the involvement of women.

The villagers have benefited from increased supply of forest produce like fodder grasses, commercial fibre grass, irrigation water, and bamboo. This has led to increased income at the household level. Increased income to the HRMS is from sale of water, fodder grass, surplus *bhabbar* in open auctions, pisciculture, fines levied, membership fees, etc. and savings thereof reflective greater employment opportunities. Programme interventions have resulted in enhanced tree and grass cover in the forest areas, improved soil moisture regime, reduced silt load from the forest catchment areas, and reduced water run-off from the catchment resulting in reduced incidence of floods downstream. The HFD has registered fewer cases of conflict, and negligent cases of theft, fires, illegal felling of wood, etc.

As far as the HFD is concerned, the initial indifference has been overcome across the board, at all hierarchical levels. While a section of the officials has progressed from indifference to debate, another section has shown staunch support and continuous enthusiasm for the development of the programme. The change in attitude among the HFD officials may be gauged from a careful observation and analysis of the discussions at the Working Group meetings. The nature and scope of issues discussed and the content of the discussions show the depth of understanding among the officials. A perceptible shift towards participatory management of resources has also been observed among the HFD.

The successful functioning of the programme in Haryana would be a function of viable and self-sustaining JFM institutions and the integration of systems for JFM in HFD's programmes, policies, and procedures. Achievements and positive factors of the Haryana JFM programme need to be strengthened further and the constraints identified to be tackled. Ownership and commitment from the HFD and the synergizing of the HRMSs as self-reliant and self-managing institutions would be key to the future.

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Niccolo Machiavelli
[*The Prince (1513)*]